CLEANER AIR OREGON RISK ASSESSMENT REPORT

COLLINS PINE COMPANY
LAKEVIEW, OREGON

Prepared for

OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY

CLEANER AIR OREGON AIR TOXICS PROGRAM

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The material and data in this report were prepared under the supervision and direction of the undersigned.

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ACRONYMS AND ABBREVIATIONS

BPIP-PRM	Building Profile Input Program incorporating the Plume Rise Model Enhancements
CAO	Cleaner Air Oregon
Collins	Collins Pine Company
DEQ	Oregon Department of Environmental Quality
DLCD	Department of Land Conservation and Development
EPA	U.S. Environmental Protection Agency
facility	Collins Pine sawmill facility located at 1600 Missouri Avenue, Lakeview, Oregon
g/s	gram(s) per second
Lakeview COOP Station	Lakeview 2NNW COOP (ID: 354670-7) meteorological station
Lake County met station	Lake County Regional Airport monitoring station (ID 94285) in Lakeview, Oregon
m	meter
MFA	Maul Foster & Alongi, Inc.
NLCD16	State of Oregon National Land Cover Dataset, 2016
OAR	Oregon Administrative Rule
RAL	risk action level
RBC	risk based concentration
TAC	toxic air contaminant
TBACT	Best Available Control Technology for Toxics
TEU	toxic emissions unit
ug/m^3	microgram(s) per cubic meter
USGS	U.S. Geological Survey
VOC	volatile organic compound

1 INTRODUCTION

Collins Pine Company (Collins) owns and operates a sawmill located at 1600 Missouri Avenue in Lakeview, Oregon ("the facility"). The facility currently operates under Standard Air Contaminant Discharge Permit No. 19-0002-ST-01 issued by the Oregon Department of Environmental Quality (DEQ) on February 27, 2014.

Maul Foster & Alongi, Inc. (MFA) has been retained by Collins to assist the facility with the dispersion modeling and risk assessment component of the Cleaner Air Oregon (CAO) permitting process. A timeline of the CAO permitting process to date is presented in Table 1-1 below.

Table 1-1. CAO Process Step Submittals and Approvals

CAO Requirement	Collins Submittal Date	DEQ Approval Date
CAO Emissions Inventory	November 25, 2019	March 9, 2020
CAO Modeling Protocol	April 22, 2020 (Final Revision—March 12, 2021)	March 25, 2021
CAO Level 3 Risk Assessment Work Plan	May 21, 2020 (Final Revision—July 25, 2020)	March 25, 2021

Oregon Administrative Rule (OAR) 340-245-0030(1)(e) states that a Level 3 risk assessment is required to be submitted to the DEQ no later than 120 days after approval of the risk assessment work plan. To satisfy this requirement, MFA performed a Level 3 Risk Assessment to estimate the potential cancer and noncancer risk impacts from the facility for comparison to the applicable risk action levels (RALs), shown in OAR 340-245-8010 Table 1.

The remainder of this risk assessment report outlines the methodology used to complete the Level 3 Risk Assessment and presents a summary of the potential cancer and noncancer risk results.

2 FACILITY DESCRIPTION

2.1 Facility Location

The facility is located in Lakeview, Oregon, west of U.S. Highway 395. The City of Lakeview is in the northern Goose Lake Valley at the foothills of the Warner Mountains, a fault-block range that rises directly behind the east edge of town. The area immediately surrounding the facility is characterized primarily by flat terrain to the west and the Warner Mountain range to the east. An aerial image of the facility location and the property boundary is shown in Figure 2-1. The topography of the area immediately surrounding the facility is presented in Figure 2-2.

The facility is surrounded by a mixture of residential, mixed-use, agricultural, and industrial land-use zones. Existing land-use zoning information for the area surrounding the facility is discussed in Section 5.1.

2.2 Process Description

The facility produces lumber from logs procured from private parties, the U.S. Forest Service, and 98,000 acres of Collins-owned land. Logs are transported to the facility by truck and unloaded for on-site storage in the log yard.

Logs are sorted in the yard by diameter for processing in the mill via one of two log lines. On the large log processing line, logs are debarked by the Salem debarker and sent to the headrig. The headrig cuts and conveys lumber to either the horizontal resaw or double arbor gang saw. The horizontal resaw feeds into the board/gang edger for further manufacturing. A lug loader is used to separate, and route individually cut boards via lug chains, to the trimming and sorting area. Multiple cyclones are used to control emissions of particulate matter generated by the sawing and trimming activities.

On the small log processing line, logs are debarked by the Nicholson A5 debarker and routed to the SL2500 small log processor. The quad saw box is used to saw sideboards off smaller diameter logs. Cut sideboards are separated and sent to the board edger and resaw for further processing. The center of the log, or cant, continues to the profiling chipping heads and vertically stacked gang saws. Lumber is then routed to the trimming and sorting area via a mechanical belt.

After trimming and sorting, lumber is sent to one of four lumber kilns for drying to optimal moisture content. Steam produced by two hogged fuel boilers is used to provide heat for each lumber-drying kiln. After drying is complete, dried lumber is sent to the planer for shaping to final product dimensions. Final products are then stacked and wrapped for storage and eventual shipment off-site.

A process flow diagram outlining the manufacturing process and locations of emission points is presented in Figure 2-3.

3 EMISSION ESTIMATES AND MODEL SOURCES

Daily and annual toxic air contaminant (TAC) emission estimates for the process equipment, considered to be toxic emissions units (TEUs) as defined in OAR 340-245-0020(61), were prepared as shown in the DEQ-approved TAC emissions inventory. The DEQ-approved daily and annual TAC emission estimates were converted to units of grams per second (g/s) for purposes of conducting the Level 3 Risk Assessment as shown in Tables 3-1 and 3-2 (attached). Tables 3-1 and 3-2 only include emission estimates for TACs with established risk-based concentrations (RBCs) set forth under OAR 340-245-8040 Table 4.

Each TEU identified in the DEQ-approved TAC emissions inventory was included in the dispersion model developed for the facility. Each TEU included in the dispersion model was modeled using a unit emission rate, equivalent to 1 g/s, for all modeled source types as shown in Table 3-3 (attached). Unit emission rate modeling is described in greater detail in Section 5.4.

3.1 Boilers

The facility uses two Wellons hogged fuel boiler to provide steam to the lumber drying kilns. Boiler 1 and Boiler 2 each have a maximum steam production capacity of 24,000 pounds of steam per hour. The primary fuel source for the boiler is hog fuel and wood chips generated on site. The boilers can produce a combined 351 million pounds of steam per year.

Process exhaust generated by each boiler is routed to dedicated multiclones to separate most of the particles from the air while it makes its way through the draft system. The exhaust stacks for the boilers were represented in the air dispersion model as individual point sources with unique labels (BLR1 and BLR2).

3.2 Kilns

There are four lumber drying kilns currently in operation at the facility. The temperature for each lumber drying kiln is controlled by thermocouple sensors set at 160 degrees Fahrenheit. If internal temperatures rise to more than 180 degrees, steam valves automatically close to prevent more steam from entering the kilns. Each lumber drying kiln processes ponderosa pine and white fir wood-species. Lumber products are dried to less than 19 percent moisture content.

3.2.1 Kiln Numbers 1, 2, and 3

Kiln numbers 1, 2, and 3 are indirectly heated by steam from the boilers. Steam is routed to heat exchangers to supply heat for each kiln. Volatile organic compound (VOC) emissions, which include volatile TACs, released during wood drying, are routed to two heat exchanger stacks. Exhaust from the heat exchanger stacks were represented in the air dispersion model as two distinct point sources with unique labels (HE1 and HE2).

3.2.2 Kiln Number 4

Kiln number 4 is indirectly heated by steam from the boilers. Fugitive VOC emissions from Kiln number 4, which include volatile TACs, are released to atmosphere through a series of passive roof vents. Fugitive emissions from Kiln number 4 was represented in the air dispersion model as two volume sources with unique labels (KILN4A and KILN4B). The length of side for both volume sources were based on the general extents of adjacent roof vents. The total emissions from Kiln number 4 were allocated evenly between the two volume sources.

3.3 Coatings

Coating products, including spray paints and marking inks with varied TAC compositions, are used for marking logs. Spray paints are used primarily in the log yard. Uncontrolled fugitive emissions from spray paints were represented in the model as a volume source with a unique label (PAINT). The length of side for this source was based on the location in which most spray paints are used. Marking ink is used inside the sawmill building, and emissions are assumed to emit to atmosphere through a passive roof vent above the in-line ink area. Uncontrolled fugitive emissions from the use of ink were represented in the air dispersion model as a volume source with a unique label (INK). The length of side for the ink volume source was based on the size of the passive roof vent.

4 AIR DISPERSION MODELING METHODOLOGY

The following subsections detail the conceptual site model for the facility. The conceptual site model was developed as a part of the Level 3 Risk Assessment. The dispersion model input and output files will be submitted to the DEQ electronically for review in support of this risk assessment report.

4.1 Model Selection

MFA set up the dispersion model of the facility using the models shown in Table 4-1 below. Lakes Environmental, a third-party overlay software, was used to execute the dispersion model.

Table 4-1. Model Select ion

Model	Model Version
AERMOD	19191
AERMET	19191
AERMAP	18081
AERSURFACE	20060
AERMINUTE	15272
BPIP-PRM	04274

4.2 Meteorological and Terrain Datasets

MFA obtained the meteorological and terrain data files shown in Table 4-2 below.

Table 4-2. Meteorological and Terrain Data

Dataset	Station ID
Surface	Station ID 94285 (Lake County Regional Airport)
Upper Air	Station ID 24225 for Medford, OR (National Oceanic and Atmospheric Administration/ Earth System Research Laboratory Radiosonde Database)
Terrain	USGS National Elevation Dataset (1/3-arc seconds with horizontal resolution of 10 [m])

4.2.1 Surface Meteorological Data

Surface meteorological data were collected from the Lake County Regional Airport monitoring station (ID 94285) located in Lakeview, Oregon (Lake County met station). Hourly data for wind speed, wind direction, cloud cover, and temperature for the years 2011 through 2018 were downloaded by file transfer protocol from the National Center for Environmental Information. The Lake County met station data were determined to be the most representative, publicly available surface meteorological data for the facility for the following reasons:

- The Lake County met station represents the only meteorological station in Lakeview, Oregon, at the northern end of the Goose Lake Valley, approximately 5.5 kilometers southwest of the facility. The Goose Lake Valley is an endorheic valley on the border between south-central Oregon and northern California. Lakeview is located along the leeward side of the Warner mountain range.
- Because of its close proximity to the leeward slope of the Warner mountain range, the Lake County met station likely records downslope winds or other micrometeorological phenomena experienced at the facility location, given its location relative to the Warner mountain range.

4.2.2 Upper Air Data

Using the Forecast Systems Laboratory format for Medford, OR (station ID 24225), upper-air meteorological data were collected from the National Oceanic and Atmospheric Administration Earth System Research Laboratory Radiosonde Database. Upper-air meteorological data were extracted from 2011 through 2018.

4.2.3 Data Processing—AERMET

The surface and upper air meteorological data were processed using the U.S. Environmental Protection Agency (EPA) AERMET program to produce five years of model-ready meteorological data for use in the AERMOD model. The adjustment to the surface frictional velocity option (i.e., ADJ_U*) was selected as part of the AERMET processing. The land-use surface characteristics were processed using AERSURFACE.

An analysis of the missing hours for the 2011 to 2018 meteorological dataset was performed by generating an SFC QA excel file generated by AERMET version 19191. Each calendar quarter was reviewed for the number of missing hours shown in the output file. To be considered complete and valid, each calendar quarter must have fewer than 10 percent missing hours. As shown in Table 4-3 (attached), multiple quarters during the eight-year period exceed this quarterly missing-hour threshold.

MFA determined that there are no secondary meteorological stations available in the Lakeview area that could be used to substitute the missing hours for each applicable calendar quarter shown in Table 4-3. Since use of surface meteorological data from the Lake County Regional Airport is preferable to stations that are not located in the Goose Lake Valley, MFA used meteorological data obtained from the same Lake County met station for different time periods to complete the data substitution as shown in Table 4-4 (attached).

The 2011 to 2015 meteorological dataset was the most complete five consecutive year period available in the eight-year dataset. Meteorological data for the 2016 to 2018 period were used to substitute missing hours until each applicable calendar quarter of the 2011 to 2015 meteorological dataset had fewer than the 10 percent missing hours. The surface and upper-air data for 2016–2018 were processed in the same manner as the 2011 to 2015 meteorological dataset. MFA used the following approach to complete the data substitution:

- Substitute Q1 and Q2 of 2013 with Q1 and Q2 of 2016
- Substitute Q1 of 2011 with Q1 of 2017
- Substitute Q1 of 2014 with Q1 of 2018

The substituted quarters were chosen because they represent the only periods that had less than 10 percent missing hours. This approach results in a full five-year meteorological dataset based on actual spatial and temporal representative meteorological data. To simplify the complexity of the substitution process, the data substitution was completed using the pre-processed surface and profile files generated by AERMET, and not the raw surface- and upper-air data files. To preserve the temporal homogeneity of the meteorological dataset, only the substituted data for the dates identified above were modified to provide a continuous five-year data set spanning from 2011 through 2015.

Table 4-4 (attached) summarizes the meteorological data assessment, after completing the necessary data substitutions. A wind rose for the complete meteorological dataset is presented in Figure 4-1. As shown in Figure 4-1, the complete meteorological dataset indicates a bimodal wind distribution with winds blowing from the north-northwest and south-southeast. This is consistent with the orientation of the Goose Lake Valley, the dominant topographic feature in the modeling domain. Figure 4-2 presents four wind roses depicting the prevailing winds for each season over the full five-year period. As shown in Figure 4-2, the bimodal distribution remains generally consistent throughout the year, with little variation between seasons.

4.3 Land Use

AERSURFACE was used to generate seasonal values for albedo, Bowen ratio, and surface roughness heights. State of Oregon National Land Cover Dataset, 2016 (NLCD16) land cover class definitions, along with concurrent percent impervious surface and percent tree canopy data were downloaded from the U.S. Geological Survey (USGS) and processed using the EPA AERSURFACE land-use tool to generate the surface characteristics necessary to run AERMET. The NLCD16 data were processed in AERSURFACE, using the settings described in Table 4-5 (attached).

Due to limited availability of precipitation data during the five-year period, a historical precipitation data trend was assessed as a surrogate for surface moisture conditions during the five-year modeling period. Annual precipitation data for the Lakeview 2NNW COOP (ID: 354670-7) meteorological station (Lakeview COOP Station) were retrieved from the Western Regional Climate Center1 for the most recent five-year period that had appropriate data availability (2002 through 2006). The Lakeview COOP Station was chosen due to its close proximity to the town of Lakeview. It is also the only meteorological station with recent publicly available precipitation data in the immediate area. The Lakeview COOP Station is owned and operated by the National Weather Service and is located adjacent to the town of Lakeview.

Due to a high volume of missing precipitation data, the most recent five-year period with adequate annual precipitation data was 2002 through 2006. For this period, the mean annual total precipitation was 13.7 inches. The mean annual total precipitation for the lifetime of the Lakeview COOP Station (1887 through 2013) is 14.3 inches. The closeness of the annual mean precipitation between the five-year period and lifetime of the Lakeview COOP Station implies that the soil moisture conditions during this period were average. Based on the results of this analysis, average soil moisture conditions were used to process the five-year meteorological dataset.

MFA executed the air dispersion model using rural dispersion coefficients. To make this determination, MFA followed the land-use procedure, as recommended by EPA's "Guideline on Air Quality Models,"2 to conclude that less than 50 percent of the land use in the modeling domain is represented by the urban land-use type.

4.4 Emissions Source Locations

The location of each TEU that was included in the dispersion model is shown in Figure 4-3.

4.5 Building Downwash

The most recent version of the EPA Building Profile Input Program, incorporating the Plume Rise Model Enhancements Algorithms (e.g., BPIP-PRM), was used to calculate direction-specific building downwash parameters for all significant building structures located at the facility. The current version of BPIP-PRM was used as shown in Table 4-1.

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[1] https://wrcc.dri.edu/ (accessed on January 12, 2020)

[2] Appendix W to Part 51—"Guideline on Air Quality Models." See Section 7.2.1.1(b).

The locations for structures that were projected to influence downwash are included in Figure 4-3. All stacks at the facility meet Good Engineering Practice design parameters. Table 4-6 (attached) presents a summary of the downwash structure heights that were included in the air dispersion model.

4.6 Receptor Locations and Terrain

Dispersion factors were determined for each modeling receptor identified outside the facility property boundary. MFA placed modeling receptors at potential exposure locations in the surrounding area up to 10 kilometers away from the center of the facility. Figure 4-4 presents the receptor spacing and locations for the modeling domain. Figure 4-5 presents the receptor locations in the immediate area surrounding the facility.

Receptors were defined in the dispersion model, as shown in Table 4-7 below. MFA placed additional receptors in 25-m space increments in areas of significant terrain, such as the Warner mountain range east and northeast of the facility. The 25-m receptor grid spanned out to 750 m north and 1,000 m east of the facility boundary to cover these areas.

Table 4-7. Receptor Locations Spacing

Receptor Spacing	Receptor Distance
25 m	Along fence line and out to: North: 750 m East: 1,000 m South and West: 200 m
50 m	North: 750 m to 1,000 m South and West: 200 m to 1,000 m
100 m	1,000 to 2,000 m
200 m	2,000 to 5,000 m
500 m	5,000 to 10,000 m

MFA identified multiple locations considered to be "sensitive areas" (e.g., schools) within approximately 1 kilometer of the facility property boundary. Identified sensitive exposure locations are presented in Table 4-8 below. Each sensitive exposure location shown in Table 4-8 was accounted for in the dispersion model by a receptor location.

Table 4-8. Identification of Sensitive Exposure Locations

UTM Coordinates (m)		Sensitive Area
Easting	Northing	
718,731	4,673,304	Lake District Hospital
718,917	4,673,895	Daly Middle School
718,910	4,673,529	Fremont/Hay Elementary School K-3
718,810	4,673,885	Lakeview Senior High School
718,386	4,674,043	Lake Education Service District
718,386	4,674,043	Lake County School District 7
718,784	4,673,562	Fremont/Hay Elementary School 4-6

Receptors were placed in the cemeteries bordering the north and east edges of the facility boundary but were not evaluated in the risk assessment. The only permanent structures in the cemeteries are tool storage sheds, so there was no need to evaluate chronic residential or occupational exposure. Although it is reasonable to assume that some burial and memorial ceremonies are conducted at the cemetery, it is unlikely that this would result in the presence of people at the cemetery for several hours of a day. The DEQ agreed with this determination via email dated April 29, 2019, "the DEQ does not feel it necessary to evaluate acute exposure at the cemetery locations bordering the facility."

As stated in the Modeling Protocol, approved March 21, 2021, receptors were placed in the small stormwater-detention basin bordering the north edge of the facility but were not evaluated in the risk assessment. This basin is surrounded by blackberry bushes and small intertwined trees growing extremely close together, and has very limited access, as determined during a site walk conducted by Collins personnel. According to OAR 340-245-0020(4)(b), an acute exposure location is "a location where people may spend several hours of one day." Based on the limited public access to the basin and the intended use of the property, it is unlikely that people would be present at the detention basin for several hours per day.

Terrain elevations for model receptors, source base elevations, and base elevations of downwash structures were taken from USGS National Elevation Dataset data at a resolution of 1/3 arc-seconds (a horizontal resolution of roughly 10 meters) and processed using the current version of AERMAP as shown in Table 4-1.

5 RISK ASSESSMENT METHODOLOGY

5.1 Land-Use Zoning Classification-Exposure Types

The Department of Land Conservation and Development's (DLCD) statewide zoning data were reviewed to determine land-use classifications for areas within the modeling domain. The statewide zoning classifications usually provide the basis for the initial categorization of exposure classifications (i.e., residential, nonresidential worker, nonresidential child, or acute). However, the project area and surrounding areas were not covered by DLCD statewide zoning data.

The zoning data were further evaluated against local data sets such as Town of Lakeview zoning, Lake County zoning, and school-location information. MFA obtained a zoning map from the Town of Lakeview, which reflects zoning data from 2018.[3] MFA also reviewed aerial imagery via Esri ArcGIS and Google Earth software, and a physical site inspection of selected areas was performed by Collins personnel to determine whether the existing zoning information reflects actual land-use and the corresponding exposure type categorization.

The zoning data and internal review process indicate multiple receptor locations fall within roadway and/or rail rights-of-way interstitial spaces as shown (in black) in Figures 4-4 and 4-5. These locations were included in the dispersion model in order to maintain a uniform receptor grid per DEQ request. MFA did not conduct risk evaluations for any receptors in roadway or rail rights-of-way as these are not exposure locations. In the crosswalk-of-receptors, previously provided to the DEQ in spreadsheet format with the DEQ-approved modeling protocol, these locations are labeled as "Risk Not Assessed," although they were modeled, and dispersion factors were generated.

Figure 4-6 presents the existing land-use zoning identified for the modeling domain, and Figure 4-7 is provided for a more detailed view of the land-use zoning in the area immediately surrounding the facility. Figures 4-8 and 4-9 present the corresponding exposure location categorization for the modeling domain and the immediate area surrounding the facility, respectively.

5.2 Exposure Pathways

It is assumed that cancer and noncancer risk (i.e., chronic and acute hazard index) resulting from facility TEUs do not have additional exposure pathways (i.e., ingestion or injection) other than those already accounted for in each published RBC.

5.3 Risk-Based Concentrations

On March 25, 2021, the DEQ approved the Level 3 Risk Assessment Work Plan submitted by the facility. Per item 2 in the approval letter, the DEQ requested the facility include an acute RBC equaling 1 microgram per cubic meter (ug/m3) for "antimony and compounds" in the final Level 3 Risk Assessment. This RBC update, and the most current RBCs published in OAR 340-245-8040 Table 4, were used for this final Level 3 Risk Assessment.

5.4 Unit Emission Rate

MFA executed the dispersion model using unit emission rates (equivalent to 1 g/s) for all TEUs, for both the annual and daily (i.e., 24-hour) averaging periods, as shown in Table 3-3 (attached).

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[3] Town of Lakeview Oregon Planning Department, "Town of Lakeview Zoning Map, July 2018."

The unit emission rate model produces the dispersion factor, in units of ug/m3/(g/s), for each modeled TEU for both averaging periods. When multiplied by the TAC emission rate for the modeled TEU, the result is the modeled concentration of the TAC. The dispersion factors were used to conduct the Level 3 Risk Assessments, in combination with TAC emission rates for each TEU in g/s and the RBCs in ug/m3 set forth under OAR 340-245-8040 Table 4.

5.4.1 Example Calculation—Level 3 Risk Assessment

Example calculations for estimating excess cancer risk and noncancer hazard index (representative of both chronic and acute assessments) for a single exposure location are presented in Equation 1 (Cancer and Chronic Noncancer) and Equation 2 (Acute Noncancer) per OAR 340-245-0210(2)(c).

Equation 1. Cancer Risk and Chronic Noncancer Hazard Index

$$\text{Excess Cancer Risk (chances-in-a-million) or Chronic Noncancer Hazard Index} \\ = \Sigma \frac{(\text{TAC annual emission rate [g/s]}) \text{ x } (\text{TEU dispersion factor } [\frac{\mu g/m^3}{g/s}])}{(\text{applicable RBC at exposure location } [\mu g/m^3])}$$

Equation 2. Acute Noncancer Hazard Index

$$\text{Acute Noncancer Hazard Index } = \Sigma \frac{(\text{TAC daily emission rate [g/s]}) \text{ x } (\text{TEU dispersion factor } [\frac{\mu g/m^3}{g/s}])}{(\text{applicable RBC at exposure location } [\mu g/m^3])}$$

The total facility excess cancer risk and chronic and acute noncancer hazard index was derived by summing each individual TAC risk contribution from all of the TEUs at each exposure location.

5.5 Risk Action Levels

The results of the Level 3 Risk Assessment were compared to the most current RALs published in OAR 340-245-8010 Table 1. As shown in the DEQ-approved TAC emissions inventory, TAC emissions from the facility are comprised of a mixture of TACs with assigned hazard indices of 3 and 5 per OAR 340-245-8030 Table 3 and OAR 340-245-8040 Table 4. The CAO rules specify that where an existing source emits a mixture of TACs with assigned hazard indices of 3 and 5, the source must determine the risk determination ratio according to the equation in OAR 340-245-0200(5) and the resulting ratios be compared to the risk determination ratio RALs in OAR 340-245-8010, Table 1. This step is not necessary if the noncancer Hazard Index values are all below 3.

5.6 Uncertainty Analysis

Although the Level 3 Risk Assessment was conducted using the most accurate and readily available information, there are various levels of uncertainty associated with the risk assessment. Per OAR 340-245-0210(2)(d), known quantitative and qualitative uncertainties with the Level 3 Risk Assessment include, but may not be limited to, the following:

Acute Assessments:

- To assess acute noncancer risk (i.e., acute hazard index), the full 24-hour exposure duration was assumed. Acute exposure can occur anywhere from one to 24 hours. Although this risk assessment assumed 24 hours of exposure, it is very unlikely that any individual would be exposed for a full 24 hours outside of a residential location. However, if the toxicity reference value is based on data collected for a lower exposure duration than the 24-hour exposure duration, maximum concentrations will likely be higher than the 24-hour average and may underestimate acute noncancer risk. For TACs with RBCs that were developed using toxicity reference values based on longer exposure durations, the Level 3 Risk Assessment may overestimate acute noncancer risk due to the 24-hour exposure duration assumption.
- The Level 3 Risk Assessment was conducted assuming each TEU at the facility is operating at maximum design capacity for 24 hours, simultaneously. For example, the boilers typically do not need to operate at maximum operational capacity to satisfy the steam requirements of the facility. It is highly unlikely that all TEUs at the facility will simultaneously operate at their maximum capacity for a 24-hour period. Therefore, the Level 3 Risk Assessment likely overestimates acute noncancer risk due to unrealistic operating conditions.
- The Level 3 Risk Assessment relies on modeling using a five-year period of hourly meteorological data. Some meteorological conditions, which may only occur a few days or less in a five-year period, result in worst-case dispersion characteristics. It is extremely unlikely that these infrequent meteorological conditions would occur at the same time that the facility is simultaneously operating all TEUs at maximum capacity. Therefore, the Level 3 Risk Assessment likely overestimates acute noncancer risk because of the improbability of facility operations at maximum capacity aligning with worst-case meteorological conditions.
- Dispersion modeling was used to determine the daily (i.e. 24-hour) dispersion factors per exposure location for use in risk estimate calculations. This method determines, for each TEU, a single day within the five-year period of hourly meteorological data, during which the highest predicted concentration occurs at each exposure location. Those TEU specific concentrations are then summed to generate the maximum aggregate concentration. It is highly unlikely that the maximum predicted concentration at a given exposure location occurs on the same day for all TEUs at the facility. For example, the highest predicted concentration for a boiler may occur at exposure location "X" on March 1 while, due to differences in location, release characteristics (i.e., stack height, velocity, etc.), and meteorological variation, the highest predicted concentration for a kiln may occur at exposure location "X" on December 1. Thus, the maximum predicted concentrations are not paired-in-time such that maximum predicted concentrations per TEU may occur on different days within the meteorological dataset. Therefore, the Level 3 Risk Assessment may overestimate acute noncancer risk because the highest predicted concentration from each TEU may not be paired-in-time at every exposure location.

Cancer and Chronic Noncancer Assessments:

- The RBCs developed by the DEQ for excess cancer risk and chronic noncancer risk assume a 70-year exposure duration for 24 hours per day. It is unlikely that a person would remain at the same residence or in areas potentially impacted by emissions covered by the CAO program for 70 consecutive years for 24 hours per day. The risk assessments also account for a person being exposed to the local facility emission rate for the entire exposure duration (i.e., 70 years). The facility has not been at the current location in the current configuration and emitting at the current rates for 70 consecutive years and nor is it likely that it ever will be. Therefore, the Level 3 Risk Assessment overestimates cancer and chronic noncancer risk due to the unrealistic exposure duration assumption.
- The excess cancer and chronic noncancer risk assessments were performed assuming that all TEUs operated for the course of the calendar year at their maximum operational capacities. It is physically impossible that the facility could operate several of its TEUs at maximum capacity for an entire year without shutdown time for maintenance and cleaning of equipment, such as the boilers or loading/unloading kiln charges. Therefore, the Level 3 Risk Assessment overestimates cancer and chronic noncancer risk due to the overestimation of emissions resulting from continuous maximum capacity facility operation.

All Assessments:

- Only excess cancer risk and chronic and acute noncancer hazard index from TACs that have RBCs published by the DEQ were assessed (in addition to the acute RBC for antimony and compounds as noted above). Table 5-1 (attached) presents a list of the TACs emitted from the facility TEUs that do not have RBCs published by the DEQ. As a result, the Level 3 Risk Assessment may not accurately assess cancer and/or noncancer risk associated with those TACs that do not yet have an associated RBC. However, the development of RBCs generally has a level of conservatism that may overestimate cancer and/or noncancer risk from TACs with known RBCs.

6 RISK ASSESSMENT RESULT SUMMARY

MFA determined the total excess cancer risk and chronic and acute noncancer risk (expressed numerically as the chronic and acute noncancer hazard index) at each modeled exposure location for significant TEUs following the applicable requirements set forth in OAR 340-245-0050(1) for Level 3 Risk Assessments. Excess cancer risk, and chronic and acute noncancer hazard index calculation methodologies are discussed in detail in Section 5. The modeled concentrations at the locations of maximum risk for each modeled TEU and exposure scenario are provided in Table 6-1 (attached).

6.1 Excess Cancer Risk

Following the Level 3 Risk Assessment methodology outlined above, the maximum predicted excess cancer risk for significant TEUs is 10 additional chances of developing cancer in a population of 1,000,000 people (chances-in-one-million) as shown in Table 6-2.

6.2 Chronic Noncancer Hazard Index

Following the Level 3 Risk Assessment methodology outlined above, the maximum predicted chronic noncancer hazard index for significant TEUs is 1.3 as shown in Table 6-2.

6.3 Acute Noncancer Hazard Index

Following the Level 3 Risk Assessment methodology outlined above, the maximum predicted acute noncancer hazard index for significant TEUs is 1.9 as shown in Table 6-2.

6.4 Risk Action Level Analysis

The Level 3 Risk Assessment was completed using TAC emission rates based on the maximum capacity for each TEU as discussed in Section 3. As shown in Table 6-3, the maximum predicted excess cancer risk, and chronic and acute noncancer hazard indices are below the TBACT RAL for existing sources per OAR 340-245-8010 Table 1. Because the calculated hazard indices are well below the TBACT RALs, the calculation of the risk determination ratio is not required. This risk assessment was performed consistent with the CAO rules in effect on the date of issuance of this report.

Table 6-3. Level 3 Risk Assessment Result Summary for Significant Toxic Emission Units

Exposure Assessment	Facility Risk / Hazard Index	RAL Analysis
Cancer Risk (chances-in-a-million)		
Residential	**10**	**Below Community Engagement Level**
Non-Residential Child	<0.1	Below Source Permit Level
Worker	0.5	Below Source Permit Level
Chronic Noncancer Hazard Index		
Residential	**1**	**Below Community Engagement Level**
Non-Residential Child	<0.1	Below Source Permit Level
Worker	0.3	Below Source Permit Level
Acute Noncancer Hazard Index	**2**	**Below TBACT Level**

NOTES:
Source Permit Level = 0.5.
Community Engagement Level = 1.
TBACT Level = 5 or 3 or a Risk Determination Ratio of > 1.0.

7 CLOSING

If there are any questions or comments regarding this risk assessment, please contact Leslie Riley at (971) 713-3578.

LIMITATIONS

The services undertaken in completing this report were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This report is solely for the use and information of our client unless otherwise noted. Any reliance on this report by a third party is at such party's sole risk.

Opinions and recommendations contained in this report apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, or the use of segregated portions of this report.

TABLES

Table 3–1
Daily Emission Rates for Significant Toxic Emission Units—RBC Only
Collins Pine Company — Lakeview, Oregon

Toxic Air Contaminant	CAS	Noncancer Class (HI)	Daily Emission Estimates																Total Facility Daily Emissions Estimate	
			Boiler 1		Boiler 2		Kilns 1-3				Kiln 4				Paints		Ink			
			(lb/day) [1]	(g/s) [a]	(lb/day) [1]	(g/s) [a]	(lb/day) [1]	(g/s) [a]	(lb/day) [1]	(g/s) [a]	(lb/day) [1]	(g/s) [a]	(lb/day) [1]	(g/s) [a]	(lb/day) [1]	(g/s) [a]	(lb/day) [1]	(g/s) [a]	(lb/day)	(g/s)
Model Release Point ID	--	--	BLR1		BLR2		HE1		HE2		KILN4A		KILN4B		PAINT		INK		--	--
Antimony and Compounds	7440-36-0	3	2.1E-03	1.1E-05	2.1E-03	1.1E-05	--	--	--	--	--	--	--	--	--	--	--	--	4.3E-03	2.2E-05
Arsenic and Compounds	7440-38-2	3	5.0E-03	2.6E-05	5.0E-03	2.6E-05	--	--	--	--	--	--	--	--	--	--	--	--	9.9E-03	5.2E-05
Beryllium and Compounds	7440-41-7	3	9.2E-05	4.8E-07	9.2E-05	4.8E-07	--	--	--	--	--	--	--	--	--	--	--	--	1.8E-04	9.7E-07
Cadmium and Compounds	7440-43-9	3	3.4E-03	1.8E-05	3.4E-03	1.8E-05	--	--	--	--	--	--	--	--	--	--	--	--	6.9E-03	3.6E-05
Chromium VI	18540-29-9	3	4.8E-03	2.5E-05	4.8E-03	2.5E-05	--	--	--	--	--	--	--	--	--	--	--	--	9.6E-03	5.0E-05
Cobalt and Compounds	7440-48-4	3	1.1E-03	6.0E-06	1.1E-03	6.0E-06	--	--	--	--	--	--	--	--	--	--	--	--	2.3E-03	1.2E-05
Copper and compounds	7440-50-8	3	0.076	4.0E-04	0.076	4.0E-04	--	--	--	--	--	--	--	--	--	--	--	--	0.15	8.0E-04
Lead and Compounds	7439-92-1	3	0.021	1.1E-04	0.021	1.1E-04	--	--	--	--	--	--	--	--	--	--	--	--	0.043	2.2E-04
Manganese and Compounds	7439-96-5	3	1.90	1.0E-02	1.90	1.0E-02	--	--	--	--	--	--	--	--	--	--	--	--	3.80	0.020
Mercury and Compounds	7439-97-6	3	1.2E-03	6.4E-06	1.2E-03	6.4E-06	--	--	--	--	--	--	--	--	--	--	--	--	2.4E-03	1.3E-05
Nickel and Compounds	7440-02-0	3	9.1E-03	4.8E-05	9.1E-03	4.8E-05	--	--	--	--	--	--	--	--	--	--	--	--	0.018	9.5E-05
Selenium and Compounds	7782-49-2	3	2.2E-03	1.2E-05	2.2E-03	1.2E-05	--	--	--	--	--	--	--	--	--	--	--	--	4.5E-03	2.3E-05
Vanadium (fume or dust)	7440-62-2	3	4.1E-04	2.1E-06	4.1E-04	2.1E-06	--	--	--	--	--	--	--	--	--	--	--	--	8.2E-04	4.3E-06
1,2-Dichloropropane	78-87-5	3	0.012	6.1E-05	0.012	6.1E-05	--	--	--	--	--	--	--	--	--	--	--	--	0.023	1.2E-04
Acetaldehyde	75-07-0	3	0.19	1.0E-03	0.19	1.0E-03	4.36	0.023	4.36	0.023	0.86	4.5E-03	0.86	4.5E-03	--	--	--	--	10.8	0.057
Acetone	67-64-1	3	--	--	--	--	--	--	--	--	--	--	--	--	0.29	1.5E-03	--	--	0.29	1.5E-03
Acrolein	107-02-8	5	0.18	9.4E-04	0.18	9.4E-04	0.13	7.1E-04	0.13	7.1E-04	0.027	1.4E-04	0.027	1.4E-04	--	--	--	--	0.68	3.6E-03
Benzene	71-43-2	3	0.67	3.5E-03	0.67	3.5E-03	--	--	--	--	--	--	--	--	--	--	--	--	1.35	7.1E-03
Carbon tetrachloride	56-23-5	3	0.014	7.3E-05	0.014	7.3E-05	--	--	--	--	--	--	--	--	--	--	--	--	0.028	1.5E-04
Chlorine	7782-50-5	3	0.84	4.4E-03	0.84	4.4E-03	--	--	--	--	--	--	--	--	--	--	--	--	1.68	8.8E-03
Chlorobenzene	108-90-7	3	0.011	6.0E-05	0.011	6.0E-05	--	--	--	--	--	--	--	--	--	--	--	--	0.023	1.2E-04
Chloroform	67-66-3	3	0.014	7.3E-05	0.014	7.3E-05	--	--	--	--	--	--	--	--	--	--	--	--	0.028	1.5E-04
Ethyl benzene	100-41-4	3	0.27	1.4E-03	0.27	1.4E-03	--	--	--	--	--	--	--	--	--	--	--	--	0.54	2.9E-03
Formaldehyde	50-00-0	3	0.70	3.7E-03	0.70	3.7E-03	0.32	1.7E-03	0.32	1.7E-03	0.063	3.3E-04	0.063	3.3E-04	--	--	--	--	2.16	0.011
Hexane	110-54-3	3	0.20	1.0E-03	0.20	1.0E-03	--	--	--	--	--	--	--	--	0.064	3.4E-04	--	--	0.46	2.4E-03
Isopropyl alcohol	67-63-0	3	2.50	0.013	2.50	0.013	--	--	--	--	--	--	--	--	--	--	0.87	4.5E-03	5.87	0.031
Methanol	67-56-1	3	0.50	2.6E-03	0.50	2.6E-03	9.67	0.051	9.67	0.051	1.92	0.010	1.92	0.010	--	--	--	--	24.2	0.13
Methyl bromide	74-83-9	3	7.8E-03	4.1E-05	7.8E-03	4.1E-05	--	--	--	--	--	--	--	--	--	--	--	--	0.016	8.2E-05
Methyl chloride	74-87-3	3	0.026	1.4E-04	0.026	1.4E-04	--	--	--	--	--	--	--	--	--	--	--	--	0.052	2.7E-04
Methyl chloroform	71-55-6	3	0.040	2.1E-04	0.040	2.1E-04	--	--	--	--	--	--	--	--	--	--	--	--	0.080	4.2E-04
Methylene chloride	75-09-2	3	0.38	2.0E-03	0.38	2.0E-03	--	--	--	--	--	--	--	--	--	--	--	--	0.75	3.9E-03
Methyl ethyl ketone	78-93-3	3	0.011	5.6E-05	0.011	5.6E-05	--	--	--	--	--	--	--	--	--	--	--	--	0.021	1.1E-04
Phenol	108-95-2	3	0.11	5.8E-04	0.11	5.8E-04	--	--	--	--	--	--	--	--	--	--	--	--	0.22	1.2E-03
Propionaldehyde	123-38-6	5	0.17	9.1E-04	0.17	9.1E-04	0.15	7.9E-04	0.15	7.9E-04	0.030	1.6E-04	0.030	1.6E-04	--	--	--	--	0.71	3.7E-03
Styrene	100-42-5	3	0.33	1.7E-03	0.33	1.7E-03	--	--	--	--	--	--	--	--	--	--	--	--	0.66	3.4E-03
Toluene	108-88-3	3	0.015	7.6E-05	0.015	7.6E-05	--	--	--	--	--	--	--	--	--	--	--	--	0.029	1.5E-04
Xylenes	1330-20-7	3	0.013	6.6E-05	0.013	6.6E-05	--	--	--	--	--	--	--	--	--	--	--	--	0.025	1.3E-04
Hydrogen fluoride	7664-39-3	3	0.16	8.5E-04	0.16	8.5E-04	--	--	--	--	--	--	--	--	--	--	--	--	0.32	1.7E-03
Hydrochloric acid	7647-01-0	3	3.00	0.016	3.00	0.016	--	--	--	--	--	--	--	--	--	--	--	--	6.00	0.031
Benz[a]anthracene	56-55-3	--	5.6E-05	2.9E-07	5.6E-05	2.9E-07	--	--	--	--	--	--	--	--	--	--	--	--	1.1E-04	5.9E-07
Benzo[a]pyrene	50-32-8	3	1.9E-03	9.9E-06	1.9E-03	9.9E-06	--	--	--	--	--	--	--	--	--	--	--	--	3.8E-03	2.0E-05
Benzo[b]fluoranthene	205-99-2	--	9.8E-05	5.1E-07	9.8E-05	5.1E-07	--	--	--	--	--	--	--	--	--	--	--	--	2.0E-04	1.0E-06
Benzo[g,h,i]perylene	191-24-2	--	1.0E-04	5.5E-07	1.0E-04	5.5E-07	--	--	--	--	--	--	--	--	--	--	--	--	2.1E-04	1.1E-06
Benzo[j]fluoranthene	205-82-3	--	1.1E-04	5.6E-07	1.1E-04	5.6E-07	--	--	--	--	--	--	--	--	--	--	--	--	2.1E-04	1.1E-06
Benzo[k]fluoranthene	207-08-9	--	3.6E-05	1.9E-07	3.6E-05	1.9E-07	--	--	--	--	--	--	--	--	--	--	--	--	7.1E-05	3.7E-07
Chrysene	218-01-9	--	5.4E-05	2.9E-07	5.4E-05	2.9E-07	--	--	--	--	--	--	--	--	--	--	--	--	1.1E-04	5.7E-07
Dibenzo[a,h]anthracene	53-70-3	--	6.6E-06	3.5E-08	6.6E-06	3.5E-08	--	--	--	--	--	--	--	--	--	--	--	--	1.3E-05	6.9E-08
Fluoranthene	206-44-0	--	1.1E-03	6.0E-06	1.1E-03	6.0E-06	--	--	--	--	--	--	--	--	--	--	--	--	2.3E-03	1.2E-05
Indeno[1,2,3-cd]pyrene	193-39-5	--	7.0E-05	3.7E-07	7.0E-05	3.7E-07	--	--	--	--	--	--	--	--	--	--	--	--	1.4E-04	7.4E-07
Naphthalene	91-20-3	3	0.068	3.6E-04	0.068	3.6E-04	--	--	--	--	--	--	--	--	--	--	--	--	0.14	7.2E-04
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6	3	4.4E-10	2.3E-12	4.4E-10	2.3E-12	--	--	--	--	--	--	--	--	--	--	--	--	8.7E-10	4.6E-12
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321-76-4	3	9.5E-10	5.0E-12	9.5E-10	5.0E-12	--	--	--	--	--	--	--	--	--	--	--	--	1.9E-09	1.0E-11
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227-28-6	3	6.3E-10	3.3E-12	6.3E-10	3.3E-12	--	--	--	--	--	--	--	--	--	--	--	--	1.3E-09	6.7E-12
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	57653-85-7	3	1.5E-09	7.9E-12	1.5E-09	7.9E-12	--	--	--	--	--	--	--	--	--	--	--	--	3.0E-09	1.6E-11
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408-74-3	3	1.6E-09	8.2E-12	1.6E-09	8.2E-12	--	--	--	--	--	--	--	--	--	--	--	--	3.1E-09	1.6E-11
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822-46-9	3	6.8E-09	3.6E-11	6.8E-09	3.6E-11	--	--	--	--	--	--	--	--	--	--	--	--	1.4E-08	7.1E-11
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	3268-87-9	3	1.7E-08	9.0E-11	1.7E-08	9.0E-11	--	--	--	--	--	--	--	--	--	--	--	--	3.4E-08	1.8E-10
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	3	5.7E-09	3.0E-11	5.7E-09	3.0E-11	--	--	--	--	--	--	--	--	--	--	--	--	1.1E-08	6.0E-11
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	3	2.8E-09	1.5E-11	2.8E-09	1.5E-11	--	--	--	--	--	--	--	--	--	--	--	--	5.6E-09	3.0E-11
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	3	3.9E-09	2.0E-11	3.9E-09	2.0E-11	--	--	--	--	--	--	--	--	--	--	--	--	7.8E-09	4.1E-11
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	3	2.5E-09	1.3E-11	2.5E-09	1.3E-11	--	--	--	--	--	--	--	--	--	--	--	--	5.0E-09	2.6E-11
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	3	2.2E-09	1.1E-11	2.2E-09	1.1E-11	--	--	--	--	--	--	--	--	--	--	--	--	4.4E-09	2.3E-11
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	3	4.6E-10	2.4E-12	4.6E-10	2.4E-12	--	--	--	--	--	--	--	--	--	--	--	--	9.1E-10	4.8E-12
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	3	1.9E-09	9.7E-12	1.9E-09	9.7E-12	--	--	--	--	--	--	--	--	--	--	--	--	3.7E-09	1.9E-11
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	3	4.0E-09	2.1E-11	4.0E-09	2.1E-11	--	--	--	--	--	--	--	--	--	--	--	--	8.0E-09	4.2E-11
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	3	6.4E-10	3.4E-12	6.4E-10	3.4E-12	--	--	--	--	--	--	--	--	--	--	--	--	1.3E-09	6.7E-12
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	39001-02-0	3	3.5E-09	1.9E-11	3.5E-09	1.9E-11	--	--	--	--	--	--	--	--	--	--	--	--	7.1E-09	3.7E-11

NOTES:

RBC = risk-based concentration.

TAC = toxic air contaminant.

(a) Emission rate (g/s) = (emission rate [lb/day]) x (453.592 g/lb) / (24 hrs/day) / (3,600 sec/hr)

REFERENCES:

(1) Emissions estimate obtained from DEQ-approved emissions inventory. Only TACs with established RBCs are included.

Table 3–2
Annual Emission Rates for Significant Toxic Emission Units—RBC Only
Collins Pine Company — Lakeview, Oregon

Toxic Air Contaminant	CAS	Noncancer Class (HI)	Annual Emission Estimates																Total Facility Annual Emissions Estimate	
			Boiler 1		Boiler 2		Kilns 1-3				Kiln 4				Paints		Ink			
			(lb/yr) (1)	(g/s) (a)	(lb/yr) (1)	(g/s) (a)	(lb/yr) (1)	(g/s) (a)	(lb/yr) (1)	(g/s) (a)	(lb/yr) (1)	(g/s) (a)	(lb/yr) (1)	(g/s) (a)	(lb/yr) (1)	(g/s) (a)	(lb/yr) (1)	(g/s) (a)	(lb/yr)	(g/s)
Model Release Point ID	--	--	BLR1		BLR2		HE1		HE2		KILN4A		KILN4B		PAINT		INK		--	--
Antimony and Compounds	7440-36-0	3	0.65	9.4E-06	0.65	9.4E-06	--	--	--	--	--	--	--	--	--	--	--	--	1.30	1.9E-05
Arsenic and Compounds	7440-38-2	3	1.51	2.2E-05	1.51	2.2E-05	--	--	--	--	--	--	--	--	--	--	--	--	3.02	4.3E-05
Beryllium and Compounds	7440-41-7	3	0.028	4.0E-07	0.028	4.0E-07	--	--	--	--	--	--	--	--	--	--	--	--	0.056	8.1E-07
Cadmium and Compounds	7440-43-9	3	1.05	1.5E-05	1.05	1.5E-05	--	--	--	--	--	--	--	--	--	--	--	--	2.09	3.0E-05
Chromium VI	18540-29-9	3	1.46	2.1E-05	1.46	2.1E-05	--	--	--	--	--	--	--	--	--	--	--	--	2.92	4.2E-05
Cobalt and Compounds	7440-48-4	3	0.35	5.0E-06	0.35	5.0E-06	--	--	--	--	--	--	--	--	--	--	--	--	0.70	1.0E-05
Copper and compounds	7440-50-8	3	23.3	3.3E-04	23.3	3.3E-04	--	--	--	--	--	--	--	--	--	--	--	--	46.5	6.7E-04
Lead and Compounds	7439-92-1	3	6.52	9.4E-05	6.52	9.4E-05	--	--	--	--	--	--	--	--	--	--	--	--	13.0	1.9E-04
Manganese and Compounds	7439-96-5	3	578	8.3E-03	578	8.3E-03	--	--	--	--	--	--	--	--	--	--	--	--	1,157	0.017
Mercury and Compounds	7439-97-6	3	0.37	5.3E-06	0.37	5.3E-06	--	--	--	--	--	--	--	--	--	--	--	--	0.74	1.1E-05
Nickel and Compounds	7440-02-0	3	2.77	4.0E-05	2.77	4.0E-05	--	--	--	--	--	--	--	--	--	--	--	--	5.53	8.0E-05
Selenium and Compounds	7782-49-2	3	0.68	9.8E-06	0.68	9.8E-06	--	--	--	--	--	--	--	--	--	--	--	--	1.36	2.0E-05
Vanadium (fume or dust)	7440-62-2	3	0.12	1.8E-06	0.12	1.8E-06	--	--	--	--	--	--	--	--	--	--	--	--	0.25	3.6E-06
1,2-Dichloropropane	78-87-5	3	3.52	5.1E-05	3.52	5.1E-05	--	--	--	--	--	--	--	--	--	--	--	--	7.04	1.0E-04
Acetaldehyde	75-07-0	3	59.3	8.5E-04	59.3	8.5E-04	2,017	0.029	2,017	0.029	400	5.8E-03	400	5.8E-03	--	--	--	--	4,953	0.071
Acetone	67-64-1	3	--	--	--	--	--	--	--	--	--	--	--	--	108	1.6E-03	--	--	108	1.6E-03
Acrolein	107-02-8	5	54.5	7.8E-04	54.5	7.8E-04	62.4	9.0E-04	62.4	9.0E-04	12.4	1.8E-04	12.4	1.8E-04	--	--	--	--	258	3.7E-03
Benzene	71-43-2	3	205	3.0E-03	205	3.0E-03	--	--	--	--	--	--	--	--	--	--	--	--	411	5.9E-03
Carbon tetrachloride	56-23-5	3	4.21	6.1E-05	4.21	6.1E-05	--	--	--	--	--	--	--	--	--	--	--	--	8.42	1.2E-04
Chlorine	7782-50-5	3	256	3.7E-03	256	3.7E-03	--	--	--	--	--	--	--	--	--	--	--	--	511	7.4E-03
Chlorobenzene	108-90-7	3	3.48	5.0E-05	3.48	5.0E-05	--	--	--	--	--	--	--	--	--	--	--	--	6.96	1.0E-04
Chloroform	67-66-3	3	4.21	6.1E-05	4.21	6.1E-05	--	--	--	--	--	--	--	--	--	--	--	--	8.42	1.2E-04
Ethyl benzene	100-41-4	3	82.8	1.2E-03	82.8	1.2E-03	--	--	--	--	--	--	--	--	--	--	--	--	166	2.4E-03
Formaldehyde	50-00-0	3	214	3.1E-03	214	3.1E-03	147	2.1E-03	147	2.1E-03	29.1	4.2E-04	29.1	4.2E-04	--	--	--	--	779	0.011
Hexane	110-54-3	3	60.3	8.7E-04	60.3	8.7E-04	--	--	--	--	--	--	--	--	24.0	3.5E-04	--	--	145	2.1E-03
Isopropyl alcohol	67-63-0	3	763	0.011	763	0.011	--	--	--	--	--	--	--	--	--	--	324	4.7E-03	1,850	0.027
Methanol	67-56-1	3	153	2.2E-03	153	2.2E-03	4,475	0.064	4,475	0.064	887	0.013	887	0.013	--	--	--	--	11,031	0.16
Methyl bromide	74-83-9	3	2.39	3.4E-05	2.39	3.4E-05	--	--	--	--	--	--	--	--	--	--	--	--	4.78	6.9E-05
Methyl chloride	74-87-3	3	7.92	1.1E-04	7.92	1.1E-04	--	--	--	--	--	--	--	--	--	--	--	--	15.8	2.3E-04
Methyl chloroform	71-55-6	3	12.1	1.7E-04	12.1	1.7E-04	--	--	--	--	--	--	--	--	--	--	--	--	24.2	3.5E-04
Methylene chloride	75-09-2	3	115	1.6E-03	115	1.6E-03	--	--	--	--	--	--	--	--	--	--	--	--	229	3.3E-03
Methyl ethyl ketone	78-93-3	3	3.27	4.7E-05	3.27	4.7E-05	--	--	--	--	--	--	--	--	--	--	--	--	6.54	9.4E-05
Phenol	108-95-2	3	33.5	4.8E-04	33.5	4.8E-04	--	--	--	--	--	--	--	--	--	--	--	--	67.1	9.6E-04
Propionaldehyde	123-38-6	5	52.8	7.6E-04	52.8	7.6E-04	69.7	1.0E-03	69.7	1.0E-03	13.8	2.0E-04	13.8	2.0E-04	--	--	--	--	273	3.9E-03
Styrene	100-42-5	3	100.0	1.4E-03	100.0	1.4E-03	--	--	--	--	--	--	--	--	--	--	--	--	200	2.9E-03
Toluene	108-88-3	3	4.42	6.4E-05	4.42	6.4E-05	--	--	--	--	--	--	--	--	--	--	--	--	8.84	1.3E-04
Xylenes	1330-20-7	3	3.85	5.5E-05	3.85	5.5E-05	--	--	--	--	--	--	--	--	--	--	--	--	7.70	1.1E-04
Hydrogen fluoride	7664-39-3	3	49.2	7.1E-04	49.2	7.1E-04	--	--	--	--	--	--	--	--	--	--	--	--	98.5	1.4E-03
Hydrochloric acid	7647-01-0	3	914	0.013	914	0.013	--	--	--	--	--	--	--	--	--	--	--	--	1,827	0.026
Benz[a]anthracene	56-55-3	--	0.017	2.5E-07	0.017	2.5E-07	--	--	--	--	--	--	--	--	--	--	--	--	0.034	4.9E-07
Benzo[a]pyrene	50-32-8	3	0.57	8.2E-06	0.57	8.2E-06	--	--	--	--	--	--	--	--	--	--	--	--	1.14	1.6E-05
Benzo[b]fluoranthene	205-99-2	--	0.030	4.3E-07	0.030	4.3E-07	--	--	--	--	--	--	--	--	--	--	--	--	0.060	8.6E-07
Benzo[g,h,i]perylene	191-24-2	--	0.032	4.6E-07	0.032	4.6E-07	--	--	--	--	--	--	--	--	--	--	--	--	0.063	9.1E-07
Benzo[j]fluoranthene	205-82-3	--	0.033	4.7E-07	0.033	4.7E-07	--	--	--	--	--	--	--	--	--	--	--	--	0.065	9.4E-07
Benzo[k]fluoranthene	207-08-9	--	0.011	1.6E-07	0.011	1.6E-07	--	--	--	--	--	--	--	--	--	--	--	--	0.022	3.1E-07
Chrysene	218-01-9	--	0.017	2.4E-07	0.017	2.4E-07	--	--	--	--	--	--	--	--	--	--	--	--	0.033	4.8E-07
Dibenzo[a,h]anthracene	53-70-3	--	2.0E-03	2.9E-08	2.0E-03	2.9E-08	--	--	--	--	--	--	--	--	--	--	--	--	4.0E-03	5.8E-08
Fluoranthene	206-44-0	--	0.35	5.0E-06	0.35	5.0E-06	--	--	--	--	--	--	--	--	--	--	--	--	0.70	1.0E-05
Indeno[1,2,3-cd]pyrene	193-39-5	--	0.021	3.1E-07	0.021	3.1E-07	--	--	--	--	--	--	--	--	--	--	--	--	0.043	6.1E-07
Naphthalene	91-20-3	3	20.9	3.0E-04	20.9	3.0E-04	--	--	--	--	--	--	--	--	--	--	--	--	41.7	6.0E-04
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6	3	1.3E-07	1.9E-12	1.3E-07	1.9E-12	--	--	--	--	--	--	--	--	--	--	--	--	2.7E-07	3.8E-12
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321-76-4	3	2.9E-07	4.2E-12	2.9E-07	4.2E-12	--	--	--	--	--	--	--	--	--	--	--	--	5.8E-07	8.3E-12
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227-28-6	3	1.9E-07	2.8E-12	1.9E-07	2.8E-12	--	--	--	--	--	--	--	--	--	--	--	--	3.9E-07	5.6E-12
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	57653-85-7	3	4.6E-07	6.6E-12	4.6E-07	6.6E-12	--	--	--	--	--	--	--	--	--	--	--	--	9.2E-07	1.3E-11
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408-74-3	3	4.8E-07	6.9E-12	4.8E-07	6.9E-12	--	--	--	--	--	--	--	--	--	--	--	--	9.6E-07	1.4E-11
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822-46-9	3	2.1E-06	3.0E-11	2.1E-06	3.0E-11	--	--	--	--	--	--	--	--	--	--	--	--	4.1E-06	6.0E-11
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	3268-87-9	3	5.2E-06	7.5E-11	5.2E-06	7.5E-11	--	--	--	--	--	--	--	--	--	--	--	--	1.0E-05	1.5E-10
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	3	1.7E-06	2.5E-11	1.7E-06	2.5E-11	--	--	--	--	--	--	--	--	--	--	--	--	3.5E-06	5.0E-11
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	3	8.6E-07	1.2E-11	8.6E-07	1.2E-11	--	--	--	--	--	--	--	--	--	--	--	--	1.7E-06	2.5E-11
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	3	1.2E-06	1.7E-11	1.2E-06	1.7E-11	--	--	--	--	--	--	--	--	--	--	--	--	2.4E-06	3.4E-11
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	3	7.6E-07	1.1E-11	7.6E-07	1.1E-11	--	--	--	--	--	--	--	--	--	--	--	--	1.5E-06	2.2E-11
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	3	6.6E-07	9.6E-12	6.6E-07	9.6E-12	--	--	--	--	--	--	--	--	--	--	--	--	1.3E-06	1.9E-11
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	3	1.4E-07	2.0E-12	1.4E-07	2.0E-12	--	--	--	--	--	--	--	--	--	--	--	--	2.8E-07	4.0E-12
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	3	5.6E-07	8.1E-12	5.6E-07	8.1E-12	--	--	--	--	--	--	--	--	--	--	--	--	1.1E-06	1.6E-11
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	3	1.2E-06	1.8E-11	1.2E-06	1.8E-11	--	--	--	--	--	--	--	--	--	--	--	--	2.4E-06	3.5E-11
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	3	2.0E-07	2.8E-12	2.0E-07	2.8E-12	--	--	--	--	--	--	--	--	--	--	--	--	3.9E-07	5.6E-12
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	39001-02-0	3	1.1E-06	1.6E-11	1.1E-06	1.6E-11	--	--	--	--	--	--	--	--	--	--	--	--	2.2E-06	3.1E-11

NOTES:

RBC = risk-based concentration.

TAC = toxic air contaminant.

(a) Emission rate (g/s) = (emission rate [lb/day]) x (453.592 g/lb) / (24 hrs/day) / (3,600 sec/hr)

REFERENCES:

(1) Emissions estimate obtained from DEQ-approved emissions inventory. Only TACs with established RBCs are included.

Table 3–3
Model Source Parameters
Collins Pine Company — Lakeview, Oregon

Point Sources

Model ID	Model Source Description	UTM Coordinates (1)		Emission Rate (2) (g/s)	Discharge Orientation (1)	Base Elevation (3) (m)	Release Height (1) (m)	Stack Diameter (1) (m)	Exit Velocity (1) (m/s)	Exit Flowrate (a) (m^3/s)	Exit Temperature (1) (K)
		Easting	Northing								
BLR1	Hogged-Fuel Boiler 1	718,464	4,675,760	1.00	VERTICAL	1,452	11.00	0.910	12.20	7.93	483
BLR2	Hogged-Fuel Boiler 2	718,464	4,675,771	1.00	VERTICAL	1,453	13.70	0.950	6.97	4.94	446
HE1	Heat Exchanger 1 (Kilns 1-3)	718,536	4,675,724	1.00	VERTICAL	1,453	10.10	1.520	11.64	21.12	308
HE2	Heat Exchanger 2 (Kilns 1-3)	718,537	4,675,702	1.00	VERTICAL	1,453	10.10	1.520	11.64	21.12	308

Volume Sources

Model ID	Model Source Description	UTM Coordinates (1)		Emission Rate (2) (g/s)	Base Elevation (3) (m)	Release Height (1) (m)	Length of Side (m)	Initial Lateral Dimension (b) (m)	Initial Vertical Dimension (m)
		Easting	Northing						
KILN4A	Drying Kiln 4	718,479	4,675,696	1.00	1,451	8.20	10.3 (5)	2.384	3.828 (c)
KILN4B	Drying Kiln 4	718,479	4,675,686	1.00	1,451	8.20	10.3 (5)	2.384	3.828 (c)
INK	Ink Usage	718,394	4,675,786	1.00	1,451	12.5	0.91 (7)	0.213	3.828 (c)
PAINT	Spray Can Usage	718,189	4,675,645	1.00	1,447	3.05	33.6 (8)	7.816	0.709 (9)

NOTES:

UTM = universal transverse mercator.

(a) Exit flowrate (m^3/s) = (π/4) x (stack diameter [m])² x (exit velocity [m/s])

(b) Initial lateral dimension (m) = (length of side [m] / (4.3) (4)

(c) Initial vertical dimension (m) = (building height [m] / (2.15) (4)

Building 11 height (m) = 8.23 (6)

Building 4 height (m) = 8.23 (6)

REFERENCES:

(1) Value based on information provided by Collins Pine Company.

(2) Dispersion model executed using unit-emission rates.

(3) Base elevation derived from the US Geological Survey National Elevation Dataset downloaded and processed in AERMET.

(4) See "Users Guide for the AMS/EPA Regulatory Model (AERMOD)," EPA-454/B-18-001 dated April 2018. Assumes elevated source on or adjacent to a building.

(5) Length of side based on physical dimensions of kiln enclosure.

(6) See Table 4-6, Summary of Downwash Structure Heights.

(7) Length of side based on relative location for coating product use within the sawmill building.

(8) Length of side based on relative location for coating product use within the log yard.

(9) Initial vertical dimension based on an average release height of 10 feet.

Table 4–3
Assessment of Missing Meteorological Data (Pre-Substitution)
Collins Pine Company — Lakeview, Oregon

Quarter [1]	Meteorological Data Assessment (Modeling Period)														
	2011			2012			2013			2014			2015		
	Total Hours [1]	Missing Hours [2]	Available [a] (%)	Total Hours [1]	Missing Hours [2]	Available [a] (%)	Total Hours [1]	Missing Hours [2]	Available [a] (%)	Total Hours [1]	Missing Hours [2]	Available [a] (%)	Total Hours [1]	Missing Hours [2]	Available [a] (%)
Q1	2,160	269	87.5% [3]	2,184	10	99.5%	2,160	572	73.5% [3]	2,160	332	84.6% [3]	2,160	6	99.7%
Q2	2,184	6	99.7%	2,184	212	90.3%	2,184	503	77.0% [3]	2,184	147	93.3%	2,184	85	96.1%
Q3	2,208	29	98.7%	2,208	158	92.8%	2,208	3	99.9%	2,208	38	98.3%	2,208	17	99.2%
Q4	2,208	12	99.5%	2,208	161	92.7%	2,208	27	98.8%	2,208	0	100%	2,208	65	97.1%

Quarter [1]	Meteorological Data Assessment (Non-modeling Period) [4]								
	2016			2017			2018		
	Total Hours [1]	Missing Hours [2]	Available [a] (%)	Total Hours [1]	Missing Hours [2]	Available [a] (%)	Total Hours [1]	Missing Hours [2]	Available [a] (%)
Q1	2,184	17	99.2%	2,160	3	99.9%	2,160	204	90.6%
Q2	2,184	25	98.9%	2,184	450	79.4% [5]	2,184	150	93.1%
Q3	2,208	625	71.7% [5]	2,208	984	55.4% [5]	2,208	290	86.9% [5]
Q4	2,208	33	98.5%	2,208	541	75.5% [5]	2,208	312	85.9% [5]

NOTES:

SFC = Surface

(a) Available hours (%) = (1 - [{missing hours} / {total hours}]) x (100%)

REFERENCES:

(1) Meteorological data obtained from the National Oceanic and Atmospheric Administration National Climatic Data Center Integrated Surface Data for the Lake County Regional Airport located in Lakeview, Oregon (WBAN: 94285).

(2) The number of missing hours was determined by generating a SFC QA excel file generated by AERMET version 19191.

(3) Data completeness for this quarter is less than 90%. Therefore, the calendar quarter requires meteorological data substitution.

(4) Represents the years 2016 - 2018 that were not chosen to be included within 5-year period for modeling. Individual quarters were identified as appropriate for data substituion, however, these data were not used as the overall yearly data completeness was less than the individual years betwen 2011 and 2015.

(5) Data completeness for this quarter is less than 90%. Therefore, the calendar quarter is not suitable for substitution into the chosen modeling dataset.

Table 4–4
Assessment of Missing Meteorological Data (Post-Substitution)
Collins Pine Company — Lakeview, Oregon

Quarter (1)	Meteorological Data Assessment per Year														
	2011			2012			2013			2014			2015		
	Total Hours (1)	Missing Hours (2)	Available (a) (%)	Total Hours (1)	Missing Hours (2)	Available (a) (%)	Total Hours (1)	Missing Hours (2)	Available (a) (%)	Total Hours (1)	Missing Hours (2)	Available (a) (%)	Total Hours (1)	Missing Hours (2)	Available (a) (%)
Q1	2,160	3	99.9% (3)	2,184	10	99.5%	2,160	17	99.2% (4)	2,160	204	90.6% (5)	2,160	6	99.7%
Q2	2,184	6	99.7%	2,184	212	90.3%	2,184	25	98.9% (4)	2,184	147	93.3%	2,184	85	96.1%
Q3	2,208	29	98.7%	2,208	158	92.8%	2,208	3	99.9%	2,208	38	98.3%	2,208	17	99.2%
Q4	2,208	12	99.5%	2,208	161	92.7%	2,208	27	98.8%	2,208	0	100.0%	2,208	65	97.1%

NOTES:

SFC = Surface

(a) Available hours (%) = (1 - [{missing hours} / {total hours}]) x (100%)

REFERENCES:

(1) Meteorological data obtained from the National Oceanic and Atmospheric Administration National Climatic Data Center Integrated Surface Data for the Lake County Regional Airport located in Lakeview, Oregon (WBAN: 94285).

(2) The number of missing hours was determined by generating a SFC QA excel file generated by AERMET version 19191.

(3) Data substitution completed using data from the first quarter of 2017.

(4) Data subtitution completed using data from the first or second quarter of 2016.

(5) Data substitution completed using data from the first quarter of 2018.

Table 4–5
AERSURFACE Settings
Collins Pine Company — Lakeview, Oregon

Parameter	Setting
Study radius for surface roughness	1.0 kilometer
Are the surface data collected at an airport?	Yes
Should continuous snow cover be assumed?	No
Soil moisture content	Average
Is this an arid region?	No
Number of sectors	12
Months assumed to constitute “winter”	December, January, and February
Months assumed to constitute “spring”	March, April, and May
Months assumed to constitute “summer”	June, July, and August
Months assumed to constitute “autumn”	September, October, and November
Period for land use calculations	Monthly

Table 4–6
Summary of Downwash Structure Heights
Collins Pine Company — Lakeview, Oregon

Downwash Structure Model ID	Base Elevation [1]		Number of Building Tiers	Tier Height [2]	
	(ft)	(m)		(ft)	(m)
BLD_01, Tier 1	4,754	1,449	2	18.0	5.49
BLD_01, Tier 2	4,754	1,449	--	30.0	9.14
BLD_02, Tier 1	4,770	1,454	2	24.0	7.32
BLD_02, Tier 2	4,770	1,454	--	27.0	8.23
BLD_03	4,768	1,453	1	21.0	6.40
BLD_04, Tier 1	4,760	1,451	2	27.0	8.23
BLD_04, Tier 2	4,760	1,451	--	39.0	11.89
BLD_05	4,763	1,452	1	40.0	12.19
BLD_06	4,761	1,451	1	27.0	8.23
BLD_07	4,766	1,453	1	24.0	7.32
BLD_08	4,765	1,452	1	40.0	12.19
BLD_09	4,766	1,453	1	33.0	10.06
BLD_10	4,769	1,454	1	48.0	14.63
BLD_11	4,760	1,451	1	27.0	8.23
BLD_12	4,762	1,451	1	30.0	9.14
BLD_13	4,754	1,449	1	27.0	8.23
BLD_14	4,755	1,449	1	24.0	7.32
BLD_15, Tier 1	4,748	1,447	2	30.0	9.14
BLD_15, Tier 2	4,748	1,447	--	42.0	12.80
BLD_16	4,748	1,447	1	33.0	10.06
BLD_17	4,745	1,446	1	36.0	10.97
BLD_18	4,746	1,446	1	36.0	10.97
BLD_19	4,752	1,449	1	34.0	10.36
BLD_20	4,747	1,447	1	33.0	10.06
BLD_21	4,744	1,446	1	40.0	12.19
BLD_22	4,751	1,448	1	21.0	6.40
BLD_23	4,777	1,456	1	24.0	7.32

REFERENCES:

(1) Base elevation derived from 1/3-arc second United States Geological Survey National Elevation Data via AERMAP View processor.

(2) Information provided by Collins Pine.

Table 5-1
Uncertainty Evaluation (TACs without an RBC)
Collins Pine Company — Lakeview, Oregon

Toxic Air Contaminant [(1)]	CAS	RBC? [(2)]
Acetophenone	98-86-2	No
Acenaphthene	83-32-9	No
Acenaphthylene	208-96-8	No
Anthracene	120-12-7	No
Benzo[e]pyrene	192-97-2	No
Fluorene	86-73-7	No
2-Methyl naphthalene	91-57-6	No
Perylene	198-55-0	No
Phenanthrene	85-01-8	No
Pyrene	129-00-0	No
Crotonaldehyde	4170-30-3	No
Diethylphthalate	84-66-2	No
Dibutyl phthalate	84-74-2	No
Molybdenum trioxide	1313-27-5	No
Barium	7440-39-3	No
Phosphorus	7723-14-0	No
Silver	7440-22-4	No
Zinc	7440-66-6	No

TAC = Toxic air contaminant.

RBC = Risk-based concentration.

OAR = Oregon Administrative Rule.

LECR = Lifetime excess cancer risk.

REFERENCES:

(1) OAR 340-245-8040, Table 4, Risk-Based Concentrations.

(2) Includes LECR, non-residential chronic hazard and acute hazard RBC.

Table 6-1
Maximum Predicted Risk Exposure Location per TEU
Collins Pine Company — Lakeview, Oregon

Modeled TEU	Cancer						Chronic Noncancer						Acute Noncancer	
	Residential		Child		Worker		Residential		Child		Worker			
	Exposure Location (1) (Location of Maximum Risk)	Dispersion Factor (µg/m^3/[g/s])	Exposure Location (1) (Location of Maximum Risk)	Dispersion Factor (µg/m^3/[g/s])	Exposure Location (1) (Location of Maximum Risk)	Dispersion Factor (µg/m^3/[g/s])	Exposure Location (1) (Location of Maximum Risk)	Dispersion Factor (µg/m^3/[g/s])	Exposure Location (1) (Location of Maximum Risk)	Dispersion Factor (µg/m^3/[g/s])	Exposure Location (1) (Location of Maximum Risk)	Dispersion Factor (µg/m^3/[g/s])	Exposure Location (1) (Location of Maximum Risk)	Dispersion Factor (µg/m^3/[g/s])
BLR1	13,148	1.80004	5,605	0.38024	10,871	3.06076	13,148	1.80004	5,605	0.38024	10,871	3.06076	10,871	23.74887
BLR2	13,148	2.84634	5,605	0.46092	10,871	3.34389	13,148	2.84634	5,605	0.46092	10,871	3.34389	10,871	22.72676
HE1	13,148	6.55418	5,605	0.44946	10,871	2.44746	13,148	6.55418	5,605	0.44946	10,871	2.44746	10,871	14.81622
HE2	13,148	6.70526	5,605	0.45637	10,871	2.64688	13,148	6.70526	5,605	0.45637	10,871	2.64688	10,871	16.14404
KILN4A	13,148	11.70712	5,605	0.74697	10,871	6.49593	13,148	11.70712	5,605	0.74697	10,871	6.49593	10,871	44.99299
KILN4B	13,148	12.10050	5,605	0.75594	10,871	6.20351	13,148	12.10050	5,605	0.75594	10,871	6.20351	10,871	42.94788
PAINT	13,148	1.83735	5,605	0.81018	10,871	2.40291	13,148	1.83735	5,605	0.81018	10,871	2.40291	10,871	27.83045
INK	13,148	6.12570	5,605	0.69781	10,871	7.27171	13,148	6.12570	5,605	0.69781	10,871	7.27171	10,871	40.00106

TEU = toxic emission unit

REFERENCES:

(1) Exposure location represents the following receptor ID coordinates in the unit emission rate dispersion model with the highest predicted cancer or noncancer risk:

Receptor ID	UTM X (m)	UTM Y (m)
5,605	718,950.00	4,673,950.00
10,871	718,400.00	4,676,075.00
13,148	718,638.33	4,675,387.39

Table 6-2
Level 3 Risk Assessment Results for Significant Toxic Emission Units
Collins Pine Company — Lakeview, Oregon

Toxic Air Contaminant	CAS	Cancer									Chronic Noncancer									Acute		
		Residential			Child			Worker			Residential			Child			Worker			Noncancer		
		Calculated Conc. [a] (μg/m³)	RBC [2] (μg/m³)	Risk [b] (chances-in 10⁶)	Calculated Conc. [a] (μg/m³)	RBC [2] (μg/m³)	Risk [b] (chances-in 10⁶)	Calculated Conc. [a] (μg/m³)	RBC [2] (μg/m³)	Risk [b] (chances-in 10⁶)	Calculated Conc. [a] (μg/m³)	RBC [2] (μg/m³)	Hazard Index [c]	Calculated Conc. [a] (μg/m³)	RBC [2] (μg/m³)	Hazard Index [c]	Calculated Conc. [a] (μg/m³)	RBC [2] (μg/m³)	Hazard Index [c]	Calculated Conc. [a] (μg/m³)	RBC [2] (μg/m³)	Hazard Index [c]
Exposure Location [3]			13,148			5,605			10,871			13,148			5,605			10,871			10,871	
Cumulative Facility-wide Risk		--	--	10	--	--	0.06	--	--	0.5	--	--	1.3	--	--	0.03	--	--	0.3	--	--	1.9
BLR1																						
Cumulative TEU Risk		--	--	3.45	--	--	0.0255	--	--	0.21	--	--	0.47	--	--	0.015	--	--	0.12	--	--	0.96
Dispersion Factor (μg/m³/[g/s])			1.80			0.38			3.06			1.80			0.38			3.06			23.7	
Antimony and Compounds	7440-36-0	1.7E-05	--	[4]	3.6E-06	--	[4]	2.9E-05	--	[4]	1.7E-05	0.30	5.6E-05	3.6E-06	1.30	2.7E-06	2.9E-05	1.30	2.2E-05	2.7E-04	1.00	2.7E-04
Arsenic and Compounds	7440-38-2	3.9E-05	2.4E-05	1.63	8.3E-06	1.3E-03	6.3E-03	6.6E-05	6.2E-04	0.11	3.9E-05	1.7E-04	0.23	8.3E-06	2.4E-03	3.4E-03	6.6E-05	2.4E-03	0.028	6.2E-04	0.20	3.1E-03
Beryllium and Compounds	7440-41-7	7.3E-07	4.2E-04	1.7E-03	1.5E-07	0.011	1.4E-05	1.2E-06	5.0E-03	2.5E-04	7.3E-07	7.0E-03	1.0E-04	1.5E-07	0.031	5.0E-06	1.2E-06	0.031	4.0E-05	1.1E-05	0.020	5.7E-04
Cadmium and Compounds	7440-43-9	2.7E-05	5.6E-04	0.048	5.7E-06	0.014	4.1E-04	4.6E-05	6.7E-03	6.9E-03	2.7E-05	5.0E-03	5.4E-03	5.7E-06	0.037	1.5E-04	4.6E-05	0.037	1.2E-03	4.3E-04	0.030	0.014
Chromium VI	18540-29-9	3.8E-05	3.1E-05	1.22	8.0E-06	5.2E-04	0.015	6.4E-05	1.0E-03	0.064	3.8E-05	0.083	4.6E-04	8.0E-06	0.88	9.1E-06	6.4E-05	0.88	7.3E-05	6.0E-04	0.30	2.0E-03
Cobalt and Compounds	7440-48-4	9.1E-06	--	[4]	1.9E-06	--	[4]	1.5E-05	--	[4]	9.1E-06	0.10	9.1E-05	1.9E-06	0.44	4.3E-06	1.5E-05	0.44	3.5E-05	1.4E-04	--	[4]
Copper and compounds	7440-50-8	6.0E-04	--	[4]	1.3E-04	--	[4]	1.0E-03	--	[4]	6.0E-04	--	[4]	1.3E-04	--	[4]	1.0E-03	--	[4]	9.5E-03	100.0	9.5E-05
Lead and Compounds	7439-92-1	1.7E-04	--	[4]	3.6E-05	--	[4]	2.9E-04	--	[4]	1.7E-04	0.15	1.1E-03	3.6E-05	0.66	5.4E-05	2.9E-04	0.66	4.3E-04	2.7E-03	0.15	0.018
Manganese and Compounds	7439-96-5	0.015	--	[4]	3.2E-03	--	[4]	0.025	--	[4]	0.015	0.090	0.17	3.2E-03	0.40	7.9E-03	0.025	0.40	0.064	0.24	0.30	0.79
Mercury and Compounds	7439-97-6	9.6E-06	--	[4]	2.0E-06	--	[4]	1.6E-05	--	[4]	9.6E-06	0.077	1.2E-04	2.0E-06	0.63	3.2E-06	1.6E-05	0.63	2.6E-05	1.5E-04	0.60	2.5E-04
Nickel and Compounds	7440-02-0	7.2E-05	3.8E-03	0.019	1.5E-05	0.10	1.5E-04	1.2E-04	0.046	2.6E-03	7.2E-05	0.014	5.1E-03	1.5E-05	0.062	2.4E-04	1.2E-04	0.062	2.0E-03	1.1E-03	0.20	5.7E-03
Selenium and Compounds	7782-49-2	1.8E-05	--	[4]	3.7E-06	--	[4]	3.0E-05	--	[4]	1.8E-05	--	[4]	3.7E-06	--	[4]	3.0E-05	--	[4]	2.8E-04	2.00	1.4E-04
Vanadium (fume or dust)	7440-62-2	3.2E-06	--	[4]	6.8E-07	--	[4]	5.5E-06	--	[4]	3.2E-06	0.10	3.2E-05	6.8E-07	0.44	1.5E-06	5.5E-06	0.44	1.2E-05	5.1E-05	0.80	6.4E-05
1,2-Dichloropropane	78-87-5	9.1E-05	--	[4]	1.9E-05	--	[4]	1.5E-04	--	[4]	9.1E-05	4.00	2.3E-05	1.9E-05	18.0	1.1E-06	1.5E-04	18.0	8.6E-06	1.4E-03	230	6.3E-06
Acetaldehyde	75-07-0	1.5E-03	0.45	3.4E-03	3.2E-04	12.0	2.7E-05	2.6E-03	5.50	4.7E-04	1.5E-03	140	1.1E-05	3.2E-04	620	5.2E-07	2.6E-03	620	4.2E-06	0.024	470	5.2E-05
Acrolein	107-02-8	1.4E-03	--	[4]	3.0E-04	--	[4]	2.4E-03	--	[4]	1.4E-03	0.35	4.0E-03	3.0E-04	1.50	2.0E-04	2.4E-03	1.50	1.6E-03	0.022	6.90	3.2E-03
Benzene	71-43-2	5.3E-03	0.13	0.041	1.1E-03	3.30	3.4E-04	9.0E-03	1.50	6.0E-03	5.3E-03	3.00	1.8E-03	1.1E-03	13.0	8.6E-05	9.0E-03	13.0	7.0E-04	0.084	29.0	2.9E-03
Carbon tetrachloride	56-23-5	1.1E-04	0.17	6.4E-04	2.3E-05	4.30	5.4E-06	1.9E-04	2.00	9.3E-05	1.1E-04	100.0	1.1E-06	2.3E-05	440	5.2E-08	1.9E-04	440	4.2E-07	1.7E-03	1,900	9.1E-07
Chlorine	7782-50-5	6.6E-03	--	[4]	1.4E-03	--	[4]	0.011	--	[4]	6.6E-03	0.15	0.044	1.4E-03	0.66	2.1E-03	0.011	0.66	0.017	0.10	170	6.2E-04
Chlorobenzene	108-90-7	9.0E-05	--	[4]	1.9E-05	--	[4]	1.5E-04	--	[4]	9.0E-05	50.0	1.8E-06	1.9E-05	220	8.6E-08	1.5E-04	220	7.0E-07	1.4E-03	--	[4]
Chloroform	67-66-3	1.1E-04	--	[4]	2.3E-05	--	[4]	1.9E-04	--	[4]	1.1E-04	300	3.6E-07	2.3E-05	1,300	1.8E-08	1.9E-04	1,300	1.4E-07	1.7E-03	490	3.5E-06
Ethyl benzene	100-41-4	2.1E-03	0.40	5.4E-03	4.5E-04	10.0	4.5E-05	3.6E-03	4.80	7.6E-04	2.1E-03	260	8.2E-06	4.5E-04	1,100	4.1E-07	3.6E-03	1,100	3.3E-06	0.034	22,000	1.5E-06
Formaldehyde	50-00-0	5.5E-03	0.17	0.033	1.2E-03	4.30	2.7E-04	9.4E-03	2.00	4.7E-03	5.5E-03	9.00	6.1E-04	1.2E-03	40.0	2.9E-05	9.4E-03	40.0	2.4E-04	0.087	49.0	1.8E-03
Hexane	110-54-3	1.6E-03	--	[4]	3.3E-04	--	[4]	2.7E-03	--	[4]	1.6E-03	700	2.2E-06	3.3E-04	3,100	1.1E-07	2.7E-03	3,100	8.6E-07	0.025	--	[4]
Isopropyl alcohol	67-63-0	0.020	--	[4]	4.2E-03	--	[4]	0.034	--	[4]	0.020	200	9.9E-05	4.2E-03	880	4.7E-06	0.034	880	3.8E-05	0.31	3,200	9.8E-05
Methanol	67-56-1	4.0E-03	--	[4]	8.4E-04	--	[4]	6.8E-03	--	[4]	4.0E-03	4,000	9.9E-07	8.4E-04	18,000	4.7E-08	6.8E-03	18,000	3.8E-07	0.063	28,000	2.2E-06
Methyl bromide	74-83-9	6.2E-05	--	[4]	1.3E-05	--	[4]	1.1E-04	--	[4]	6.2E-05	5.00	1.2E-05	1.3E-05	22.0	5.9E-07	1.1E-04	22.0	4.8E-06	9.8E-04	3,900	2.5E-07
Methyl chloride	74-87-3	2.1E-04	--	[4]	4.3E-05	--	[4]	3.5E-04	--	[4]	2.1E-04	90.0	2.3E-06	4.3E-05	400	1.1E-07	3.5E-04	400	8.7E-07	3.2E-03	1,000	3.2E-06
Methyl chloroform	71-55-6	3.1E-04	--	[4]	6.6E-05	--	[4]	5.3E-04	--	[4]	3.1E-04	5,000	6.3E-08	6.6E-05	22,000	3.0E-09	5.3E-04	22,000	2.4E-08	5.0E-03	11,000	4.5E-07
Methylene chloride	75-09-2	3.0E-03	59.0	5.0E-05	6.3E-04	620	1.0E-06	5.0E-03	1,200	4.2E-06	3.0E-03	600	4.9E-06	6.3E-04	2,600	2.4E-07	5.0E-03	2,600	1.9E-06	0.047	2,100	2.2E-05
Methyl ethyl ketone	78-93-3	8.5E-05	--	[4]	1.8E-05	--	[4]	1.4E-04	--	[4]	8.5E-05	5,000	1.7E-08	1.8E-05	22,000	8.1E-10	1.4E-04	22,000	6.5E-09	1.3E-03	5,000	2.7E-07
Phenol	108-95-2	8.7E-04	--	[4]	1.8E-04	--	[4]	1.5E-03	--	[4]	8.7E-04	200	4.3E-06	1.8E-04	880	2.1E-07	1.5E-03	880	1.7E-06	0.014	5,800	2.4E-06
Propionaldehyde	123-38-6	1.4E-03	--	[4]	2.9E-04	--	[4]	2.3E-03	--	[4]	1.4E-03	8.00	1.7E-04	2.9E-04	35.0	8.3E-06	2.3E-03	35.0	6.6E-05	0.022	--	[4]
Styrene	100-42-5	2.6E-03	--	[4]	5.5E-04	--	[4]	4.4E-03	--	[4]	2.6E-03	1,000	2.6E-06	5.5E-04	4,400	1.2E-07	4.4E-03	4,400	1.0E-06	0.041	21,000	1.9E-06
Toluene	108-88-3	1.1E-04	--	[4]	2.4E-05	--	[4]	1.9E-04	--	[4]	1.1E-04	5,000	2.3E-08	2.4E-05	22,000	1.1E-09	1.9E-04	22,000	8.8E-09	1.8E-03	7,500	2.4E-07
Xylenes	1330-20-7	1.0E-04	--	[4]	2.1E-05	--	[4]	1.7E-04	--	[4]	1.0E-04	220	4.5E-07	2.1E-05	970	2.2E-08	1.7E-04	970	1.7E-07	1.6E-03	8,700	1.8E-07
Hydrogen fluoride	7664-39-3	1.3E-03	--	[4]	2.7E-04	--	[4]	2.2E-03	--	[4]	1.3E-03	2.10	6.1E-04	2.7E-04	19.0	1.4E-05	2.2E-03	19.0	1.1E-04	0.020	16.0	1.3E-03
Hydrochloric acid	7647-01-0	0.024	--	[4]	5.0E-03	--	[4]	0.040	--	[4]	0.024	20.0	1.2E-03	5.0E-03	88.0	5.7E-05	0.040	88.0	4.6E-04	0.37	2,100	1.8E-04
Benz[a]anthracene	56-55-3	4.4E-07	2.1E-04	2.1E-03	9.3E-08	7.8E-03	1.2E-05	7.5E-07	0.015	5.0E-05	4.4E-07	--	[4]	9.3E-08	--	[4]	7.5E-07	--	[4]	7.0E-06	--	[4]
Benzo[a]pyrene	50-32-8	1.5E-05	4.3E-05	0.34	3.1E-06	1.6E-03	2.0E-03	2.5E-05	3.0E-03	8.4E-03	1.5E-05	2.0E-03	7.4E-03	3.1E-06	8.8E-03	3.6E-04	2.5E-05	8.8E-03	2.9E-03	2.3E-04	2.0E-03	0.12
Benzo[b]fluoranthene	205-99-2	7.7E-07	5.3E-05	0.015	1.6E-07	2.0E-03	8.1E-05	1.3E-06	3.8E-03	3.4E-04	7.7E-07	--	[4]	1.6E-07	--	[4]	1.3E-06	--	[4]	1.2E-05	--	[4]
Benzo[g,h,i]perylene	191-24-2	8.2E-07	4.7E-03	1.7E-04	1.7E-07	0.17	1.0E-06	1.4E-06	0.34	4.1E-06	8.2E-07	--	[4]	1.7E-07	--	[4]	1.4E-06	--	[4]	1.3E-05	--	[4]
Benzo[j]fluoranthene	205-82-3	8.5E-07	1.4E-04	6.0E-03	1.8E-07	5.2E-03	3.4E-05	1.4E-06	0.010	1.4E-04	8.5E-07	--	[4]	1.8E-07	--	[4]	1.4E-06	--	[4]	1.3E-05	--	[4]
Benzo[k]fluoranthene	207-08-9	2.8E-07	1.4E-03	2.0E-04	5.9E-08	0.052	1.1E-06	4.8E-07	0.10	4.8E-06	2.8E-07	--	[4]	5.9E-08	--	[4]	4.8E-07	--	[4]	4.4E-06	--	[4]
Chrysene	218-01-9	4.3E-07	4.3E-04	1.0E-03	9.1E-08	0.016	5.7E-06	7.3E-07	0.030	2.4E-05	4.3E-07	--	[4]	9.1E-08	--	[4]	7.3E-07	--	[4]	6.8E-06	--	[4]
Dibenzo[a,h]anthracene	53-70-3	5.2E-08	4.3E-06	0.012	1.1E-08	1.6E-04	6.8E-05	8.8E-08	3.0E-04	2.9E-04	5.2E-08	--	[4]	1.1E-08	--	[4]	8.8E-08	--	[4]	8.2E-07	--	[4]
Fluoranthene	206-44-0	9.1E-06	5.3E-04	0.017	1.9E-06	0.020	9.6E-05	1.5E-05	0.038	4.1E-04	9.1E-06	--	[4]	1.9E-06	--	[4]	1.5E-05	--	[4]	1.4E-04	--	[4]
Indeno[1,2,3-cd]pyrene	193-39-5	5.5E-07	6.1E-04	9.1E-04	1.2E-07	0.022	5.3E-06	9.4E-07	0.043	2.2E-05	5.5E-07	--	[4]	1.2E-07	--	[4]	9.4E-07	--	[4]	8.7E-06	--	[4]
Naphthalene	91-20-3	5.4E-04	0.029	0.019	1.1E-04	0.76	1.5E-04	9.2E-04	0.35	2.6E-03	5.4E-04	3.70	1.5E-04	1.1E-04	16.0	7.1E-06	9.2E-04	16.0	5.7E-05	8.5E-03	200	4.3E-05
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6	3.4E-12	1.0E-09	3.4E-03	7.3E-13	9.0E-08	8.1E-06	5.8E-12	4.2E-08	1.4E-04	3.4E-12	1.3E-07	2.6E-05	7.3E-13	2.6E-05	2.8E-08	5.8E-12	2.6E-05	2.2E-07	5.4E-11	--	[4]
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321-76-4	7.5E-12	1.0E-09	7.5E-03	1.6E-12	9.0E-08	1.8E-05	1.3E-11	4.2E-08	3.0E-04	7.5E-12	1.3E-07	5.8E-05	1.6E-12	2.6E-05	6.1E-08	1.3E-11	2.6E-05	4.9E-07	1.2E-10	--	[4]
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227-28-6	5.0E-12	1.0E-08	5.0E-04	1.1E-12	9.0E-07	1.2E-06	8.5E-12	4.2E-07	2.0E-05	5.0E-12	1.3E-06	3.8E-06	1.1E-12	2.6E-04	4.1E-09	8.5E-12	2.6E-04	3.3E-08	7.9E-11	--	[4]
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	57653-85-7	1.2E-11	1.0E-08	1.2E-03	2.5E-12	9.0E-07	2.8E-06	2.0E-11	4.2E-07	4.8E-05	1.2E-11	1.3E-06	9.2E-06	2.5E-12	2.6E-04	9.7E-09	2.0E-11	2.6E-04	7.8E-08	1.9E-10	--	[4]
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408-74-3	1.2E-11	1.0E-08	1.2E-03	2.6E-12	9.0E-07	2.9E-06	2.1E-11	4.2E-07	5.0E-05	1.2E-11	1.3E-06	9.5E-06	2.6E-12	2.6E-04	1.0E-08	2.1E-11	2.6E-04	8.1E-08	2.0E-10	--	[4]

Table 6-2
Level 3 Risk Assessment Results for Significant Toxic Emission Units
Collins Pine Company — Lakeview, Oregon

Toxic Air Contaminant	CAS	Cancer									Chronic Noncancer									Acute		
		Residential			Child			Worker			Residential			Child			Worker			Noncancer		
		Calculated Conc. (a) (µg/m^3)	RBC (2) (µg/m^3)	Risk (b) (chances-in 10^6)	Calculated Conc. (a) (µg/m^3)	RBC (2) (µg/m^3)	Risk (b) (chances-in 10^6)	Calculated Conc. (a) (µg/m^3)	RBC (2) (µg/m^3)	Risk (b) (chances-in 10^6)	Calculated Conc. (a) (µg/m^3)	RBC (2) (µg/m^3)	Hazard Index (c)	Calculated Conc. (a) (µg/m^3)	RBC (2) (µg/m^3)	Hazard Index (c)	Calculated Conc. (a) (µg/m^3)	RBC (2) (µg/m^3)	Hazard Index (c)	Calculated Conc. (a) (µg/m^3)	RBC (2) (µg/m^3)	Hazard Index (c)
Exposure Location (3)			13,148			5,605			10,871			13,148			5,605			10,871			10,871	
Cumulative Facility-wide Risk		--	--	10	--	--	0.06	--	--	0.5	--	--	1.3	--	--	0.03	--	--	0.3	--	--	1.9
BLR1 (Continued)																						
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822-46-9	5.4E-11	1.0E-07	5.4E-04	1.1E-11	9.0E-06	1.3E-06	9.1E-11	4.2E-06	2.2E-05	5.4E-11	1.3E-05	4.1E-06	1.1E-11	2.6E-03	4.4E-09	9.1E-11	2.6E-03	3.5E-08	8.5E-10	--	(4)
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	3268-87-9	1.4E-10	3.4E-06	4.0E-05	2.9E-11	3.0E-04	9.6E-08	2.3E-10	1.4E-04	1.6E-06	1.4E-10	4.2E-04	3.2E-07	2.9E-11	0.085	3.4E-10	2.3E-10	0.085	2.7E-09	2.1E-09	--	(4)
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	4.5E-11	1.0E-08	4.5E-03	9.5E-12	9.0E-07	1.1E-05	7.7E-11	4.2E-07	1.8E-04	4.5E-11	1.3E-06	3.5E-05	9.5E-12	2.6E-04	3.7E-08	7.7E-11	2.6E-04	2.9E-07	7.1E-10	--	(4)
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	2.2E-11	3.4E-08	6.5E-04	4.7E-12	3.0E-06	1.6E-06	3.8E-11	1.4E-06	2.7E-05	2.2E-11	4.2E-06	5.3E-06	4.7E-12	8.5E-04	5.5E-09	3.8E-11	8.5E-04	4.4E-08	3.5E-10	--	(4)
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	3.1E-11	3.4E-09	9.0E-03	6.5E-12	3.0E-07	2.2E-05	5.2E-11	1.4E-07	3.7E-04	3.1E-11	4.2E-07	7.3E-05	6.5E-12	8.5E-05	7.6E-08	5.2E-11	8.5E-05	6.2E-07	4.9E-10	--	(4)
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	2.0E-11	1.0E-08	2.0E-03	4.2E-12	9.0E-07	4.6E-06	3.4E-11	4.2E-07	8.0E-05	2.0E-11	1.3E-06	1.5E-05	4.2E-12	2.6E-04	1.6E-08	3.4E-11	2.6E-04	1.3E-07	3.1E-10	--	(4)
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	1.7E-11	1.0E-08	1.7E-03	3.6E-12	9.0E-07	4.0E-06	2.9E-11	4.2E-07	7.0E-05	1.7E-11	1.3E-06	1.3E-05	3.6E-12	2.6E-04	1.4E-08	2.9E-11	2.6E-04	1.1E-07	2.7E-10	--	(4)
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	3.6E-12	1.0E-08	3.6E-04	7.6E-13	9.0E-07	8.4E-07	6.1E-12	4.2E-07	1.5E-05	3.6E-12	1.3E-06	2.8E-06	7.6E-13	2.6E-04	2.9E-09	6.1E-12	2.6E-04	2.3E-08	5.7E-11	--	(4)
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	1.5E-11	1.0E-08	1.5E-03	3.1E-12	9.0E-07	3.4E-06	2.5E-11	4.2E-07	5.9E-05	1.5E-11	1.3E-06	1.1E-05	3.1E-12	2.6E-04	1.2E-08	2.5E-11	2.6E-04	9.5E-08	2.3E-10	--	(4)
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	3.2E-11	1.0E-07	3.2E-04	6.7E-12	9.0E-06	7.4E-07	5.4E-11	4.2E-06	1.3E-05	3.2E-11	1.3E-05	2.4E-06	6.7E-12	2.6E-03	2.6E-09	5.4E-11	2.6E-03	2.1E-08	5.0E-10	--	(4)
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	5.1E-12	1.0E-07	5.1E-05	1.1E-12	9.0E-06	1.2E-07	8.6E-12	4.2E-06	2.0E-06	5.1E-12	1.3E-05	3.9E-07	1.1E-12	2.6E-03	4.1E-10	8.6E-12	2.6E-03	3.3E-09	8.0E-11	--	(4)
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	39001-02-0	2.8E-11	3.4E-06	8.2E-06	5.9E-12	3.0E-04	2.0E-08	4.8E-11	1.4E-04	3.4E-07	2.8E-11	4.2E-04	6.7E-08	5.9E-12	0.085	6.9E-11	4.8E-11	0.085	5.6E-10	4.4E-10	--	(4)
BLR2																						
Cumulative TEU Risk		--	--	5.46	--	--	0.031	--	--	0.23	--	--	0.74	--	--	0.018	--	--	0.13	--	--	0.92
Dispersion Factor (µg/m^3/[g/s])			2.85			0.46			3.34			2.85			0.46			3.34			22.7	
Antimony and Compounds	7440-36-0	2.7E-05	--	(4)	4.3E-06	--	(4)	3.1E-05	--	(4)	2.7E-05	0.30	8.9E-05	4.3E-06	1.30	3.3E-06	3.1E-05	1.30	2.4E-05	2.6E-04	1.00	2.6E-04
Arsenic and Compounds	7440-38-2	6.2E-05	2.4E-05	2.57	1.0E-05	1.3E-03	7.7E-03	7.3E-05	6.2E-04	0.12	6.2E-05	1.7E-04	0.36	1.0E-05	2.4E-03	4.2E-03	7.3E-05	2.4E-03	0.030	5.9E-04	0.20	3.0E-03
Beryllium and Compounds	7440-41-7	1.1E-06	4.2E-04	2.7E-03	1.9E-07	0.011	1.7E-05	1.4E-06	5.0E-03	2.7E-04	1.1E-06	7.0E-03	1.6E-04	1.9E-07	0.031	6.0E-06	1.4E-06	0.031	4.4E-05	1.1E-05	0.020	5.5E-04
Cadmium and Compounds	7440-43-9	4.3E-05	5.6E-04	0.076	6.9E-06	0.014	5.0E-04	5.0E-05	6.7E-03	7.5E-03	4.3E-05	5.0E-03	8.6E-03	6.9E-06	0.037	1.9E-04	5.0E-05	0.037	1.4E-03	4.1E-04	0.030	0.014
Chromium VI	18540-29-9	6.0E-05	3.1E-05	1.93	9.7E-06	5.2E-04	0.019	7.0E-05	1.0E-03	0.070	6.0E-05	0.083	7.2E-04	9.7E-06	0.88	1.1E-05	7.0E-05	0.88	8.0E-05	5.7E-04	0.30	1.9E-03
Cobalt and Compounds	7440-48-4	1.4E-05	--	(4)	2.3E-06	--	(4)	1.7E-05	--	(4)	1.4E-05	0.10	1.4E-04	2.3E-06	0.44	5.3E-06	1.7E-05	0.44	3.8E-05	1.4E-04	--	(4)
Copper and compounds	7440-50-8	9.5E-04	--	(4)	1.5E-04	--	(4)	1.1E-03	--	(4)	9.5E-04	--	(4)	1.5E-04	--	(4)	1.1E-03	--	(4)	9.1E-03	100.0	9.1E-05
Lead and Compounds	7439-92-1	2.7E-04	--	(4)	4.3E-05	--	(4)	3.1E-04	--	(4)	2.7E-04	0.15	1.8E-03	4.3E-05	0.66	6.5E-05	3.1E-04	0.66	4.7E-04	2.6E-03	0.15	0.017
Manganese and Compounds	7439-96-5	0.024	--	(4)	3.8E-03	--	(4)	0.028	--	(4)	0.024	0.090	0.26	3.8E-03	0.40	9.6E-03	0.028	0.40	0.070	0.23	0.30	0.75
Mercury and Compounds	7439-97-6	1.5E-05	--	(4)	2.5E-06	--	(4)	1.8E-05	--	(4)	1.5E-05	0.077	2.0E-04	2.5E-06	0.63	3.9E-06	1.8E-05	0.63	2.8E-05	1.5E-04	0.60	2.4E-04
Nickel and Compounds	7440-02-0	1.1E-04	3.8E-03	0.030	1.8E-05	0.10	1.8E-04	1.3E-04	0.046	2.9E-03	1.1E-04	0.014	8.1E-03	1.8E-05	0.062	3.0E-04	1.3E-04	0.062	2.1E-03	1.1E-03	0.20	5.4E-03
Selenium and Compounds	7782-49-2	2.8E-05	--	(4)	4.5E-06	--	(4)	3.3E-05	--	(4)	2.8E-05	--	(4)	4.5E-06	--	(4)	3.3E-05	--	(4)	2.7E-04	2.00	1.3E-04
Vanadium (fume or dust)	7440-62-2	5.1E-06	--	(4)	8.3E-07	--	(4)	6.0E-06	--	(4)	5.1E-06	0.10	5.1E-05	8.3E-07	0.44	1.9E-06	6.0E-06	0.44	1.4E-05	4.9E-05	0.80	6.1E-05
1,2-Dichloropropane	78-87-5	1.4E-04	--	(4)	2.3E-05	--	(4)	1.7E-04	--	(4)	1.4E-04	4.00	3.6E-05	2.3E-05	18.0	1.3E-06	1.7E-04	18.0	9.4E-06	1.4E-03	230	6.0E-06
Acetaldehyde	75-07-0	2.4E-03	0.45	5.4E-03	3.9E-04	12.0	3.3E-05	2.9E-03	5.50	5.2E-04	2.4E-03	140	1.7E-05	3.9E-04	620	6.3E-07	2.9E-03	620	4.6E-06	0.023	470	4.9E-05
Acrolein	107-02-8	2.2E-03	--	(4)	3.6E-04	--	(4)	2.6E-03	--	(4)	2.2E-03	0.35	6.4E-03	3.6E-04	1.50	2.4E-04	2.6E-03	1.50	1.7E-03	0.021	6.90	3.1E-03
Benzene	71-43-2	8.4E-03	0.13	0.065	1.4E-03	3.30	4.1E-04	9.9E-03	1.50	6.6E-03	8.4E-03	3.00	2.8E-03	1.4E-03	13.0	1.0E-04	9.9E-03	13.0	7.6E-04	0.080	29.0	2.8E-03
Carbon tetrachloride	56-23-5	1.7E-04	0.17	1.0E-03	2.8E-05	4.30	6.5E-06	2.0E-04	2.00	1.0E-04	1.7E-04	100.0	1.7E-06	2.8E-05	440	6.3E-08	2.0E-04	440	4.6E-07	1.6E-03	1,900	8.7E-07
Chlorine	7782-50-5	0.010	--	(4)	1.7E-03	--	(4)	0.012	--	(4)	0.010	0.15	0.070	1.7E-03	0.66	2.6E-03	0.012	0.66	0.019	0.10	170	5.9E-04
Chlorobenzene	108-90-7	1.4E-04	--	(4)	2.3E-05	--	(4)	1.7E-04	--	(4)	1.4E-04	50.0	2.8E-06	2.3E-05	220	1.0E-07	1.7E-04	220	7.6E-07	1.4E-03	--	(4)
Chloroform	67-66-3	1.7E-04	--	(4)	2.8E-05	--	(4)	2.0E-04	--	(4)	1.7E-04	300	5.7E-07	2.8E-05	1,300	2.1E-08	2.0E-04	1,300	1.6E-07	1.6E-03	490	3.4E-06
Ethyl benzene	100-41-4	3.4E-03	0.40	8.5E-03	5.5E-04	10.0	5.5E-05	4.0E-03	4.80	8.3E-04	3.4E-03	260	1.3E-05	5.5E-04	1,100	5.0E-07	4.0E-03	1,100	3.6E-06	0.032	22,000	1.5E-06
Formaldehyde	50-00-0	8.8E-03	0.17	0.051	1.4E-03	4.30	3.3E-04	0.010	2.00	5.1E-03	8.8E-03	9.00	9.7E-04	1.4E-03	40.0	3.5E-05	0.010	40.0	2.6E-04	0.084	49.0	1.7E-03
Hexane	110-54-3	2.5E-03	--	(4)	4.0E-04	--	(4)	2.9E-03	--	(4)	2.5E-03	700	3.5E-06	4.0E-04	3,100	1.3E-07	2.9E-03	3,100	9.4E-07	0.024	--	(4)
Isopropyl alcohol	67-63-0	0.031	--	(4)	5.1E-03	--	(4)	0.037	--	(4)	0.031	200	1.6E-04	5.1E-03	880	5.7E-06	0.037	880	4.2E-05	0.30	3,200	9.3E-05
Methanol	67-56-1	6.3E-03	--	(4)	1.0E-03	--	(4)	7.4E-03	--	(4)	6.3E-03	4,000	1.6E-06	1.0E-03	18,000	5.6E-08	7.4E-03	18,000	4.1E-07	0.060	28,000	2.1E-06
Methyl bromide	74-83-9	9.8E-05	--	(4)	1.6E-05	--	(4)	1.1E-04	--	(4)	9.8E-05	5.00	2.0E-05	1.6E-05	22.0	7.2E-07	1.1E-04	22.0	5.2E-06	9.4E-04	3,900	2.4E-07
Methyl chloride	74-87-3	3.2E-04	--	(4)	5.3E-05	--	(4)	3.8E-04	--	(4)	3.2E-04	90.0	3.6E-06	5.3E-05	400	1.3E-07	3.8E-04	400	9.5E-07	3.1E-03	1,000	3.1E-06
Methyl chloroform	71-55-6	5.0E-04	--	(4)	8.0E-05	--	(4)	5.8E-04	--	(4)	5.0E-04	5,000	9.9E-08	8.0E-05	22,000	3.6E-09	5.8E-04	22,000	2.6E-08	4.7E-03	11,000	4.3E-07
Methylene chloride	75-09-2	4.7E-03	59.0	8.0E-05	7.6E-04	620	1.2E-06	5.5E-03	1,200	4.6E-06	4.7E-03	600	7.8E-06	7.6E-04	2,600	2.9E-07	5.5E-03	2,600	2.1E-06	0.045	2,100	2.1E-05
Methyl ethyl ketone	78-93-3	1.3E-04	--	(4)	2.2E-05	--	(4)	1.6E-04	--	(4)	1.3E-04	5,000	2.7E-08	2.2E-05	22,000	9.9E-10	1.6E-04	22,000	7.1E-09	1.3E-03	5,000	2.6E-07
Phenol	108-95-2	1.4E-03	--	(4)	2.2E-04	--	(4)	1.6E-03	--	(4)	1.4E-03	200	6.9E-06	2.2E-04	880	2.5E-07	1.6E-03	880	1.8E-06	0.013	5,800	2.3E-06
Propionaldehyde	123-38-6	2.2E-03	--	(4)	3.5E-04	--	(4)	2.5E-03	--	(4)	2.2E-03	8.00	2.7E-04	3.5E-04	35.0	1.0E-05	2.5E-03	35.0	7.3E-05	0.021	--	(4)
Styrene	100-42-5	4.1E-03	--	(4)	6.6E-04	--	(4)	4.8E-03	--	(4)	4.1E-03	1,000	4.1E-06	6.6E-04	4,400	1.5E-07	4.8E-03	4,400	1.1E-06	0.039	21,000	1.9E-06
Toluene	108-88-3	1.8E-04	--	(4)	2.9E-05	--	(4)	2.1E-04	--	(4)	1.8E-04	5,000	3.6E-08	2.9E-05	22,000	1.3E-09	2.1E-04	22,000	9.7E-09	1.7E-03	7,500	2.3E-07
Xylenes	1330-20-7	1.6E-04	--	(4)	2.6E-05	--	(4)	1.9E-04	--	(4)	1.6E-04	220	7.2E-07	2.6E-05	970	2.6E-08	1.9E-04	970	1.9E-07	1.5E-03	8,700	1.7E-07
Hydrogen fluoride	7664-39-3	2.0E-03	--	(4)	3.3E-04	--	(4)	2.4E-03	--	(4)	2.0E-03	2.10	9.6E-04	3.3E-04	19.0	1.7E-05	2.4E-03	19.0	1.2E-04	0.019	16.0	1.2E-03
Hydrochloric acid	7647-01-0	0.037	--	(4)	6.1E-03	--	(4)	0.044	--	(4)	0.037	20.0	1.9E-03	6.1E-03	88.0	6.9E-05	0.044	88.0	5.0E-04	0.36	2,100	1.7E-04
Benz[a]anthracene	56-55-3	7.0E-07	2.1E-04	3.3E-03	1.1E-07	7.8E-03	1.4E-05	8.2E-07	0.015	5.5E-05	7.0E-07	--	(4)	1.1E-07	--	(4)	8.2E-07	--	(4)	6.7E-06	--	(4)
Benzo[a]pyrene	50-32-8	2.3E-05	4.3E-05	0.54	3.8E-06	1.6E-03	2.4E-03	2.8E-05	3.0E-03	9.2E-03	2.3E-05	2.0E-03	0.012	3.8E-06	8.8E-03	4.3E-04	2.8E-05	8.8E-03	3.1E-03	2.2E-04	2.0E-03	0.11
Benzo[b]fluoranthene	205-99-2	1.2E-06	5.3E-05	0.023	2.0E-07	2.0E-03	9.9E-05	1.4E-06	3.8E-03	3.8E-04	1.2E-06	--	(4)	2.0E-07	--	(4)	1.4E-06	--	(4)	1.2E-05	--	(4)

Table 6-2
Level 3 Risk Assessment Results for Significant Toxic Emission Units
Collins Pine Company — Lakeview, Oregon

Toxic Air Contaminant	CAS	Cancer									Chronic Noncancer									Acute		
		Residential			Child			Worker			Residential			Child			Worker			Noncancer		
		Calculated Conc. [a] (μg/m^3)	RBC [2] (μg/m^3)	Risk [b] (chances-in 10^6)	Calculated Conc. [a] (μg/m^3)	RBC [2] (μg/m^3)	Risk [b] (chances-in 10^6)	Calculated Conc. [a] (μg/m^3)	RBC [2] (μg/m^3)	Risk [b] (chances-in 10^6)	Calculated Conc. [a] (μg/m^3)	RBC [2] (μg/m^3)	Hazard Index [c]	Calculated Conc. [a] (μg/m^3)	RBC [2] (μg/m^3)	Hazard Index [c]	Calculated Conc. [a] (μg/m^3)	RBC [2] (μg/m^3)	Hazard Index [c]	Calculated Conc. [a] (μg/m^3)	RBC [2] (μg/m^3)	Hazard Index [c]
Exposure Location [3]			**13,148**			**5,605**			**10,871**			**13,148**			**5,605**			**10,871**			**10,871**	
Cumulative Facility-wide Risk		--	--	**10**	--	--	**0.06**	--	--	**0.5**	--	--	**1.3**	--	--	**0.03**	--	--	**0.3**	--	--	**1.9**
BLR2 (Continued)																						
Benzo[g,h,i]perylene	191-24-2	1.3E-06	4.7E-03	2.8E-04	2.1E-07	0.17	1.2E-06	1.5E-06	0.34	4.5E-06	1.3E-06	--	[4]	2.1E-07	--	[4]	1.5E-06	--	[4]	1.2E-05	--	[4]
Benzo[j]fluoranthene	205-82-3	1.3E-06	1.4E-04	9.6E-03	2.2E-07	5.2E-03	4.2E-05	1.6E-06	0.010	1.6E-04	1.3E-06	--	[4]	2.2E-07	--	[4]	1.6E-06	--	[4]	1.3E-05	--	[4]
Benzo[k]fluoranthene	207-08-9	4.4E-07	1.4E-03	3.2E-04	7.2E-08	0.052	1.4E-06	5.2E-07	0.10	5.2E-06	4.4E-07	--	[4]	7.2E-08	--	[4]	5.2E-07	--	[4]	4.3E-06	--	[4]
Chrysene	218-01-9	6.8E-07	4.3E-04	1.6E-03	1.1E-07	0.016	6.9E-06	8.0E-07	0.030	2.7E-05	6.8E-07	--	[4]	1.1E-07	--	[4]	8.0E-07	--	[4]	6.5E-06	--	[4]
Dibenzo[a,h]anthracene	53-70-3	8.2E-08	4.3E-06	0.019	1.3E-08	1.6E-04	8.3E-05	9.6E-08	3.0E-04	3.2E-04	8.2E-08	--	[4]	1.3E-08	--	[4]	9.6E-08	--	[4]	7.8E-07	--	[4]
Fluoranthene	206-44-0	1.4E-05	5.3E-04	0.027	2.3E-06	0.020	1.2E-04	1.7E-05	0.038	4.4E-04	1.4E-05	--	[4]	2.3E-06	--	[4]	1.7E-05	--	[4]	1.4E-04	--	[4]
Indeno[1,2,3-cd]pyrene	193-39-5	8.8E-07	6.1E-04	1.4E-03	1.4E-07	0.022	6.4E-06	1.0E-06	0.043	2.4E-05	8.8E-07	--	[4]	1.4E-07	--	[4]	1.0E-06	--	[4]	8.4E-06	--	[4]
Naphthalene	91-20-3	8.5E-04	0.029	0.029	1.4E-04	0.76	1.8E-04	1.0E-03	0.35	2.9E-03	8.5E-04	3.70	2.3E-04	1.4E-04	16.0	8.6E-06	1.0E-03	16.0	6.3E-05	8.2E-03	200	4.1E-05
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6	5.4E-12	1.0E-09	5.4E-03	8.8E-13	9.0E-08	9.8E-06	6.4E-12	4.2E-08	1.5E-04	5.4E-12	1.3E-07	4.2E-05	8.8E-13	2.6E-05	3.4E-08	6.4E-12	2.6E-05	2.5E-07	5.2E-11	--	[4]
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321-76-4	1.2E-11	1.0E-09	0.012	1.9E-12	9.0E-08	2.1E-05	1.4E-11	4.2E-08	3.3E-04	1.2E-11	1.3E-07	9.1E-05	1.9E-12	2.6E-05	7.4E-08	1.4E-11	2.6E-05	5.3E-07	1.1E-10	--	[4]
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227-28-6	7.9E-12	1.0E-08	7.9E-04	1.3E-12	9.0E-07	1.4E-06	9.3E-12	4.2E-07	2.2E-05	7.9E-12	1.3E-06	6.1E-06	1.3E-12	2.6E-04	4.9E-09	9.3E-12	2.6E-04	3.6E-08	7.6E-11	--	[4]
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	57653-85-7	1.9E-11	1.0E-08	1.9E-03	3.1E-12	9.0E-07	3.4E-06	2.2E-11	4.2E-07	5.3E-05	1.9E-11	1.3E-06	1.5E-05	3.1E-12	2.6E-04	1.2E-08	2.2E-11	2.6E-04	8.5E-08	1.8E-10	--	[4]
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408-74-3	2.0E-11	1.0E-08	2.0E-03	3.2E-12	9.0E-07	3.5E-06	2.3E-11	4.2E-07	5.5E-05	2.0E-11	1.3E-06	1.5E-05	3.2E-12	2.6E-04	1.2E-08	2.3E-11	2.6E-04	8.8E-08	1.9E-10	--	[4]
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822-46-9	8.5E-11	1.0E-07	8.5E-04	1.4E-11	9.0E-06	1.5E-06	1.0E-10	4.2E-06	2.4E-05	8.5E-11	1.3E-05	6.5E-06	1.4E-11	2.6E-03	5.3E-09	1.0E-10	2.6E-03	3.8E-08	8.1E-10	--	[4]
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	3268-87-9	2.1E-10	3.4E-06	6.3E-05	3.5E-11	3.0E-04	1.2E-07	2.5E-10	1.4E-04	1.8E-06	2.1E-10	4.2E-04	5.1E-07	3.5E-11	0.085	4.1E-10	2.5E-10	0.085	3.0E-09	2.1E-09	--	[4]
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	7.1E-11	1.0E-08	7.1E-03	1.2E-11	9.0E-07	1.3E-05	8.4E-11	4.2E-07	2.0E-04	7.1E-11	1.3E-06	5.5E-05	1.2E-11	2.6E-04	4.4E-08	8.4E-11	2.6E-04	3.2E-07	6.8E-10	--	[4]
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	3.5E-11	3.4E-08	1.0E-03	5.7E-12	3.0E-06	1.9E-06	4.1E-11	1.4E-06	2.9E-05	3.5E-11	4.2E-06	8.4E-06	5.7E-12	8.5E-04	6.7E-09	4.1E-11	8.5E-04	4.8E-08	3.4E-10	--	[4]
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	4.9E-11	3.4E-09	0.014	7.9E-12	3.0E-07	2.6E-05	5.7E-11	1.4E-07	4.1E-04	4.9E-11	4.2E-07	1.2E-04	7.9E-12	8.5E-05	9.3E-08	5.7E-11	8.5E-05	6.7E-07	4.7E-10	--	[4]
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	3.1E-11	1.0E-08	3.1E-03	5.1E-12	9.0E-07	5.6E-06	3.7E-11	4.2E-07	8.7E-05	3.1E-11	1.3E-06	2.4E-05	5.1E-12	2.6E-04	1.9E-08	3.7E-11	2.6E-04	1.4E-07	3.0E-10	--	[4]
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	2.7E-11	1.0E-08	2.7E-03	4.4E-12	9.0E-07	4.9E-06	3.2E-11	4.2E-07	7.6E-05	2.7E-11	1.3E-06	2.1E-05	4.4E-12	2.6E-04	1.7E-08	3.2E-11	2.6E-04	1.2E-07	2.6E-10	--	[4]
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	5.7E-12	1.0E-08	5.7E-04	9.2E-13	9.0E-07	1.0E-06	6.7E-12	4.2E-07	1.6E-05	5.7E-12	1.3E-06	4.4E-06	9.2E-13	2.6E-04	3.5E-09	6.7E-12	2.6E-04	2.6E-08	5.4E-11	--	[4]
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	2.3E-11	1.0E-08	2.3E-03	3.7E-12	9.0E-07	4.2E-06	2.7E-11	4.2E-07	6.5E-05	2.3E-11	1.3E-06	1.8E-05	3.7E-12	2.6E-04	1.4E-08	2.7E-11	2.6E-04	1.0E-07	2.2E-10	--	[4]
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	5.0E-11	1.0E-07	5.0E-04	8.1E-12	9.0E-06	9.0E-07	5.9E-11	4.2E-06	1.4E-05	5.0E-11	1.3E-05	3.8E-06	8.1E-12	2.6E-03	3.1E-09	5.9E-11	2.6E-03	2.3E-08	4.8E-10	--	[4]
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	8.0E-12	1.0E-07	8.0E-05	1.3E-12	9.0E-06	1.4E-07	9.4E-12	4.2E-06	2.2E-06	8.0E-12	1.3E-05	6.2E-07	1.3E-12	2.6E-03	5.0E-10	9.4E-12	2.6E-03	3.6E-09	7.7E-11	--	[4]
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	39001-02-0	4.4E-11	3.4E-06	1.3E-05	7.2E-12	3.0E-04	2.4E-08	5.2E-11	1.4E-04	3.7E-07	4.4E-11	4.2E-04	1.1E-07	7.2E-12	0.085	8.4E-11	5.2E-11	0.085	6.1E-10	4.2E-10	--	[4]
HE1																						
Cumulative TEU Risk		--	--	**0.50**	--	--	**1.3E-03**	--	--	**0.015**	--	--	**0.021**	--	--	**3.3E-04**	--	--	**1.8E-03**	--	--	**2.8E-03**
Dispersion Factor (μg/m^3/[g/s])			**6.55**			**0.45**			**2.45**			**6.55**			**0.45**			**2.45**			**14.8**	
Acetaldehyde	75-07-0	0.19	0.45	0.42	0.013	12.0	1.1E-03	0.071	5.50	0.013	0.19	140	1.4E-03	0.013	620	2.1E-05	0.071	620	1.1E-04	0.34	470	7.2E-04
Acrolein	107-02-8	5.9E-03	--	[4]	4.0E-04	--	[4]	2.2E-03	--	[4]	5.9E-03	0.35	0.017	4.0E-04	1.50	2.7E-04	2.2E-03	1.50	1.5E-03	0.010	6.90	1.5E-03
Formaldehyde	50-00-0	0.014	0.17	0.081	9.5E-04	4.30	2.2E-04	5.2E-03	2.00	2.6E-03	0.014	9.00	1.5E-03	9.5E-04	40.0	2.4E-05	5.2E-03	40.0	1.3E-04	0.025	49.0	5.0E-04
Methanol	67-56-1	0.42	--	[4]	0.029	--	[4]	0.16	--	[4]	0.42	4,000	1.1E-04	0.029	18,000	1.6E-06	0.16	18,000	8.8E-06	0.75	28,000	2.7E-05
Propionaldehyde	123-38-6	6.6E-03	--	[4]	4.5E-04	--	[4]	2.5E-03	--	[4]	6.6E-03	8.00	8.2E-04	4.5E-04	35.0	1.3E-05	2.5E-03	35.0	7.0E-05	0.012	--	[4]
HE2																						
Cumulative TEU Risk		--	--	**0.52**	--	--	**1.3E-03**	--	--	**0.017**	--	--	**0.021**	--	--	**3.3E-04**	--	--	**1.9E-03**	--	--	**3.0E-03**
Dispersion Factor (μg/m^3/[g/s])			**6.71**			**0.46**			**2.65**			**6.71**			**0.46**			**2.65**			**16.1**	
Acetaldehyde	75-07-0	0.19	0.45	0.43	0.013	12.0	1.1E-03	0.077	5.50	0.014	0.19	140	1.4E-03	0.013	620	2.1E-05	0.077	620	1.2E-04	0.37	470	7.9E-04
Acrolein	107-02-8	6.0E-03	--	[4]	4.1E-04	--	[4]	2.4E-03	--	[4]	6.0E-03	0.35	0.017	4.1E-04	1.50	2.7E-04	2.4E-03	1.50	1.6E-03	0.011	6.90	1.7E-03
Formaldehyde	50-00-0	0.014	0.17	0.083	9.6E-04	4.30	2.2E-04	5.6E-03	2.00	2.8E-03	0.014	9.00	1.6E-03	9.6E-04	40.0	2.4E-05	5.6E-03	40.0	1.4E-04	0.027	49.0	5.5E-04
Methanol	67-56-1	0.43	--	[4]	0.029	--	[4]	0.17	--	[4]	0.43	4,000	1.1E-04	0.029	18,000	1.6E-06	0.17	18,000	9.5E-06	0.82	28,000	2.9E-05
Propionaldehyde	123-38-6	6.7E-03	--	[4]	4.6E-04	--	[4]	2.7E-03	--	[4]	6.7E-03	8.00	8.4E-04	4.6E-04	35.0	1.3E-05	2.7E-03	35.0	7.6E-05	0.013	--	[4]
KILN4A																						
Cumulative TEU Risk		--	--	**0.18**	--	--	**4.3E-04**	--	--	**8.2E-03**	--	--	**7.3E-03**	--	--	**1.1E-04**	--	--	**9.4E-04**	--	--	**1.7E-03**
Dispersion Factor (μg/m^3/[g/s])			**11.7**			**0.75**			**6.50**			**11.7**			**0.75**			**6.50**			**45.0**	
Acetaldehyde	75-07-0	0.067	0.45	0.15	4.3E-03	12.0	3.6E-04	0.037	5.50	6.8E-03	0.067	140	4.8E-04	4.3E-03	620	6.9E-06	0.037	620	6.0E-05	0.20	470	4.3E-04
Acrolein	107-02-8	2.1E-03	--	[4]	1.3E-04	--	[4]	1.2E-03	--	[4]	2.1E-03	0.35	5.9E-03	1.3E-04	1.50	8.9E-05	1.2E-03	1.50	7.7E-04	6.3E-03	6.90	9.1E-04
Formaldehyde	50-00-0	4.9E-03	0.17	0.029	3.1E-04	4.30	7.3E-05	2.7E-03	2.00	1.4E-03	4.9E-03	9.00	5.4E-04	3.1E-04	40.0	7.8E-06	2.7E-03	40.0	6.8E-05	0.015	49.0	3.0E-04
Methanol	67-56-1	0.15	--	[4]	9.5E-03	--	[4]	0.083	--	[4]	0.15	4,000	3.7E-05	9.5E-03	18,000	5.3E-07	0.083	18,000	4.6E-06	0.45	28,000	1.6E-05
Propionaldehyde	123-38-6	2.3E-03	--	[4]	1.5E-04	--	[4]	1.3E-03	--	[4]	2.3E-03	8.00	2.9E-04	1.5E-04	35.0	4.2E-06	1.3E-03	35.0	3.7E-05	7.1E-03	--	[4]

Table 6-2
Level 3 Risk Assessment Results for Significant Toxic Emission Units
Collins Pine Company — Lakeview, Oregon

Toxic Air Contaminant	CAS	Cancer									Chronic Noncancer									Acute		
		Residential			Child			Worker			Residential			Child			Worker			Noncancer		
		Calculated Conc. (a) (μg/m³)	RBC (2) (μg/m³)	Risk (b) (chances-in 10⁶)	Calculated Conc. (a) (μg/m³)	RBC (2) (μg/m³)	Risk (b) (chances-in 10⁶)	Calculated Conc. (a) (μg/m³)	RBC (2) (μg/m³)	Risk (b) (chances-in 10⁶)	Calculated Conc. (a) (μg/m³)	RBC (2) (μg/m³)	Hazard Index (c)	Calculated Conc. (a) (μg/m³)	RBC (2) (μg/m³)	Hazard Index (c)	Calculated Conc. (a) (μg/m³)	RBC (2) (μg/m³)	Hazard Index (c)	Calculated Conc. (a) (μg/m³)	RBC (2) (μg/m³)	Hazard Index (c)
Exposure Location (3)		**13,148**			**5,605**			**10,871**			**13,148**			**5,605**			**10,871**			**10,871**		
Cumulative Facility-wide Risk		--	--	**10**	--	--	**0.06**	--	--	**0.5**	--	--	**1.3**	--	--	**0.03**	--	--	**0.3**	--	--	**1.9**
KILN4B																						
Cumulative TEU Risk		--	--	**0.18**	--	--	**4.4E-04**	--	--	**7.8E-03**	--	--	**7.5E-03**	--	--	**1.1E-04**	--	--	**9.0E-04**	--	--	**1.6E-03**
Dispersion Factor (μg/m³/[g/s])		**12.1**			**0.76**			**6.20**			**12.1**			**0.76**			**6.20**			**42.9**		
Acetaldehyde	75-07-0	0.070	0.45	0.15	4.3E-03	12.0	3.6E-04	0.036	5.50	6.5E-03	0.070	140	5.0E-04	4.3E-03	620	7.0E-06	0.036	620	5.8E-05	0.19	470	4.1E-04
Acrolein	107-02-8	2.2E-03	--	(4)	1.3E-04	--	(4)	1.1E-03	--	(4)	2.2E-03	0.35	6.1E-03	1.3E-04	1.50	9.0E-05	1.1E-03	1.50	7.4E-04	6.0E-03	6.90	8.7E-04
Formaldehyde	50-00-0	5.1E-03	0.17	0.030	3.2E-04	4.30	7.4E-05	2.6E-03	2.00	1.3E-03	5.1E-03	9.00	5.6E-04	3.2E-04	40.0	7.9E-06	2.6E-03	40.0	6.5E-05	0.014	49.0	2.9E-04
Methanol	67-56-1	0.15	--	(4)	9.6E-03	--	(4)	0.079	--	(4)	0.15	4,000	3.9E-05	9.6E-03	18,000	5.4E-07	0.079	18,000	4.4E-06	0.43	28,000	1.5E-05
Propionaldehyde	123-38-6	2.4E-03	--	(4)	1.5E-04	--	(4)	1.2E-03	--	(4)	2.4E-03	8.00	3.0E-04	1.5E-04	35.0	4.3E-06	1.2E-03	35.0	3.5E-05	6.7E-03	--	(4)
PAINT																						
Cumulative TEU Risk		--	--	**0**	--	--	**0**	--	--	**0**	--	--	**1.0E-06**	--	--	**9.9E-08**	--	--	**2.9E-07**	--	--	**6.8E-07**
Dispersion Factor (μg/m³/[g/s])		**1.84**			**0.81**			**2.40**			**1.84**			**0.81**			**2.40**			**27.8**		
Acetone	67-64-1	2.9E-03	--	(4)	1.3E-03	--	(4)	3.7E-03	--	(4)	2.9E-03	31,000	9.2E-08	1.3E-03	140,000	9.0E-09	3.7E-03	140,000	2.7E-08	0.042	62,000	6.8E-07
Hexane	110-54-3	6.4E-04	--	(4)	2.8E-04	--	(4)	8.3E-04	--	(4)	6.4E-04	700	9.1E-07	2.8E-04	3,100	9.0E-08	8.3E-04	3,100	2.7E-07	9.4E-03	--	(4)
INK																						
Cumulative TEU Risk		--	--	**0**	--	--	**0**	--	--	**0**	--	--	**1.4E-04**	--	--	**3.7E-06**	--	--	**3.9E-05**	--	--	**5.7E-05**
Dispersion Factor (μg/m³/[g/s])		**6.13**			**0.70**			**7.27**			**6.13**			**0.70**			**7.27**			**40.0**		
Isopropyl alcohol (isopropanol)	67-63-0	0.029	--	(4)	3.3E-03	--	(4)	0.034	--	(4)	0.029	200	1.4E-04	3.3E-03	880	3.7E-06	0.034	880	3.9E-05	0.18	3,200	5.7E-05

RBC = risk-based concentration.

TEU = toxic emission unit.

TAC = toxic air contaminant.

NOTES:

(a) Calculated concentration (μg/m³) = (dispersion factor [(μg/m³)/(g/s)]) x (TAC emission rate per TEU [g/s])
TAC emission rate per TEU (g/s) = (1)

(b) Risk (chances-in-1,000,000) = (calculated concentration [μg/m³]) / (risk-based concentration [μg/m³])

(c) Hazard index = (calculated concentration [μg/m³]) / (risk-based concentration [μg/m³])

REFERENCES:

(1) See Table 3-1, Daily Emission Rates for Significant Toxic Emission Units—RBC Only for Acute, and Table 3-2, Annual Emission Rates for Significant Toxic Emission Units—RBC Only for Cancer and Chronic Noncancer.

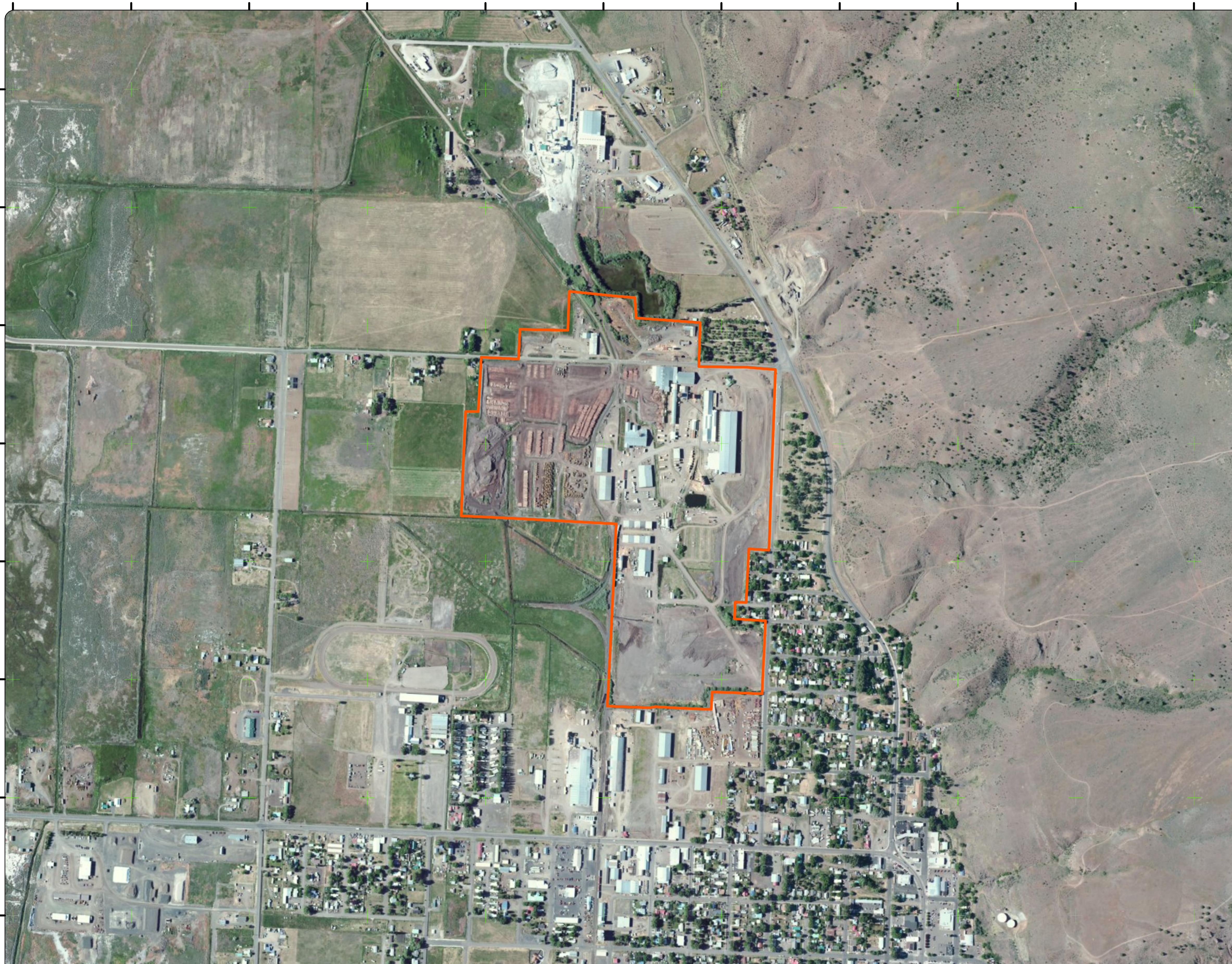
(2) Oregon Administrative Rule 340-245-8040, Table 4, Risk-Based Concentrations.

(3) Represents the exposure location with the highest predicted cancer or noncancer risk per exposure category.

(4) TAC does not have an established RBC for this exposure category per Oregon Administrative Rule 340-245-8040, Table 4.

FIGURES

Figure 2-1
Aerial Photograph of Facility
Collins Pine Company
Lakeview, Oregon

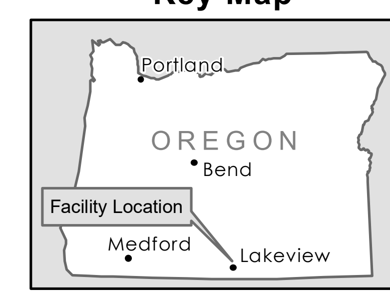


Legend

Property Boundary

UTM Grid Guideline

Key Map



0 0.25 0.5
Kilometers

Source: Aerial photograph obtained from Esri ArcGIS Online

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Path: X:\8006.59\01\Projects\Fig2_1_Aerial_Photograph_of_Facility.mxd

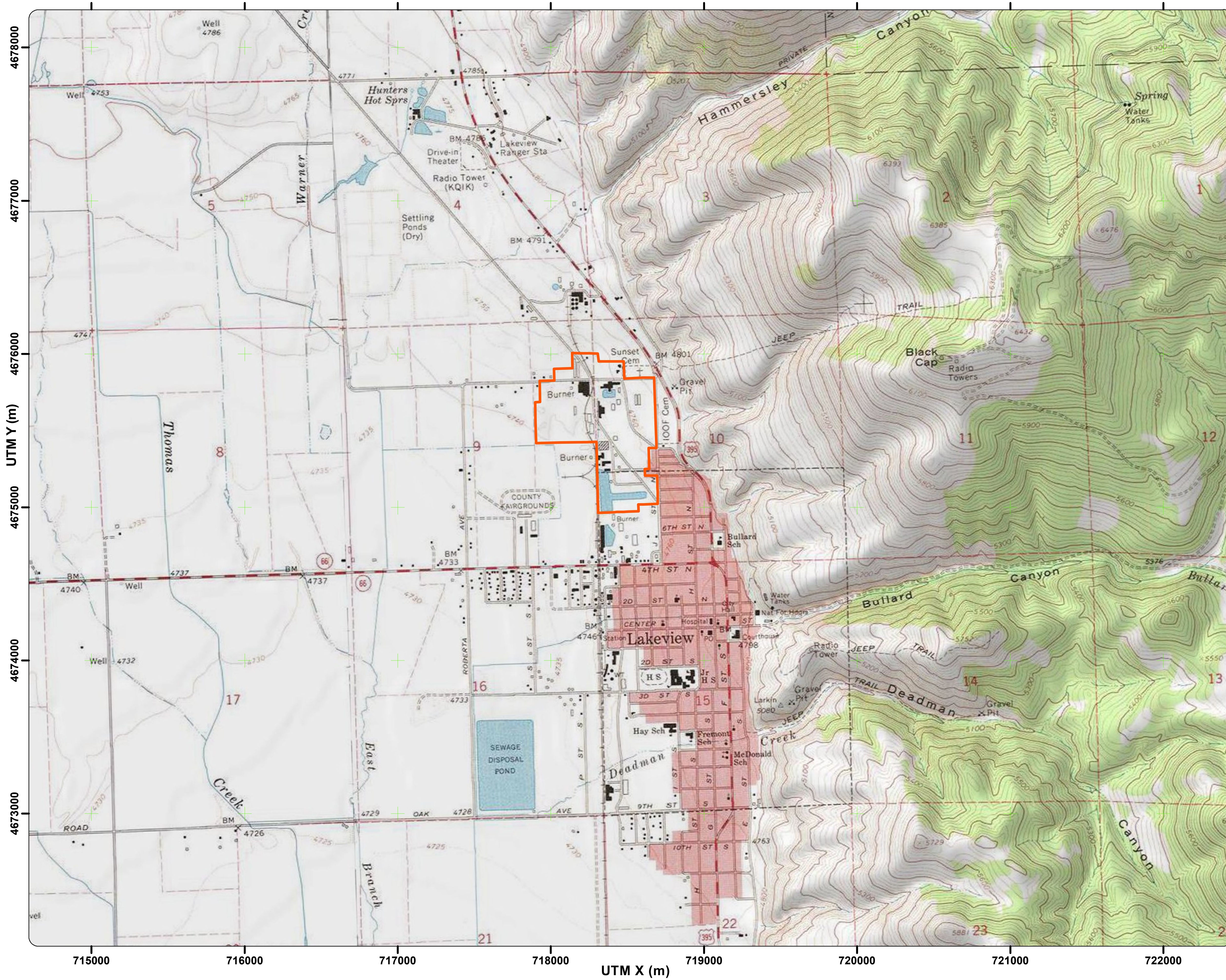
Print Date: 4/1/2020

Approved By:

Produced By: mjosef

Project: 1443.03.01

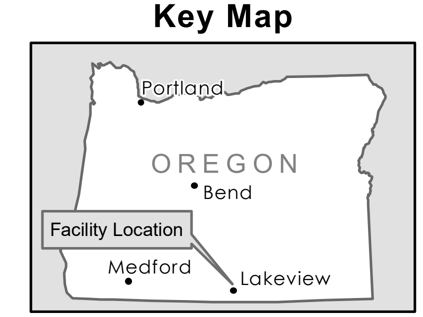
Figure 2-2
Local Topography
Collins Pine Company
Lakeview, Oregon



Legend

- Property Boundary
- UTM Grid Guideline

Key Map



0 0.5 1
Kilometers

Source: Topographic map obtained from USGS via ESRI ArcGIS online.

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Path: X:\8006.5901\Projects\Fig2_2_Local_Topography.mxd
Print Date: 4/1/2020
Approved By:
Produced By: mjosef
Project: 1443.03.01

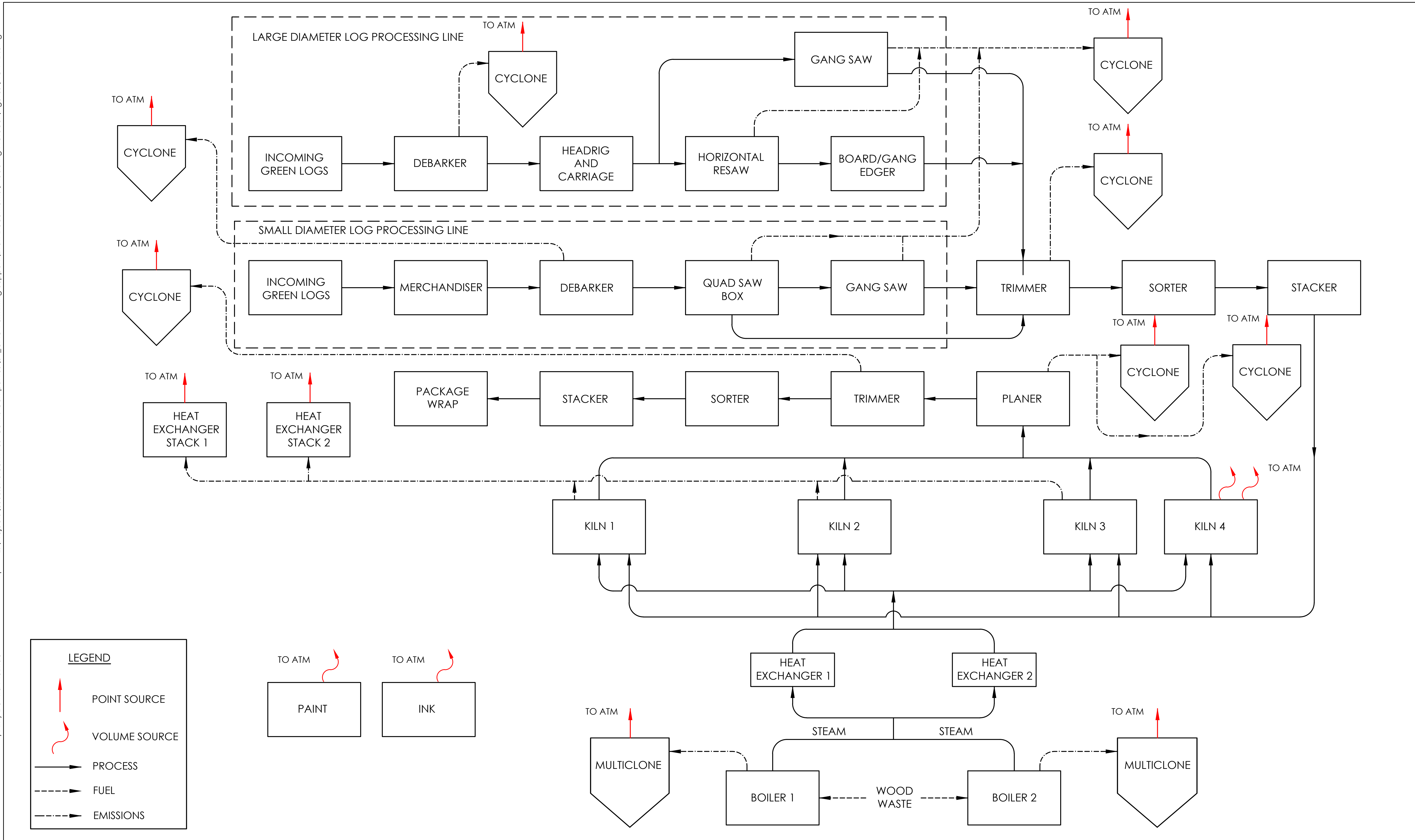

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Figure 2-3
Process Flow Diagram
Collins Pine Company
Lakeview, Oregon

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Printed by:Amy DeVita-McBride
Date: 6/12/2020 5:15:12 PM

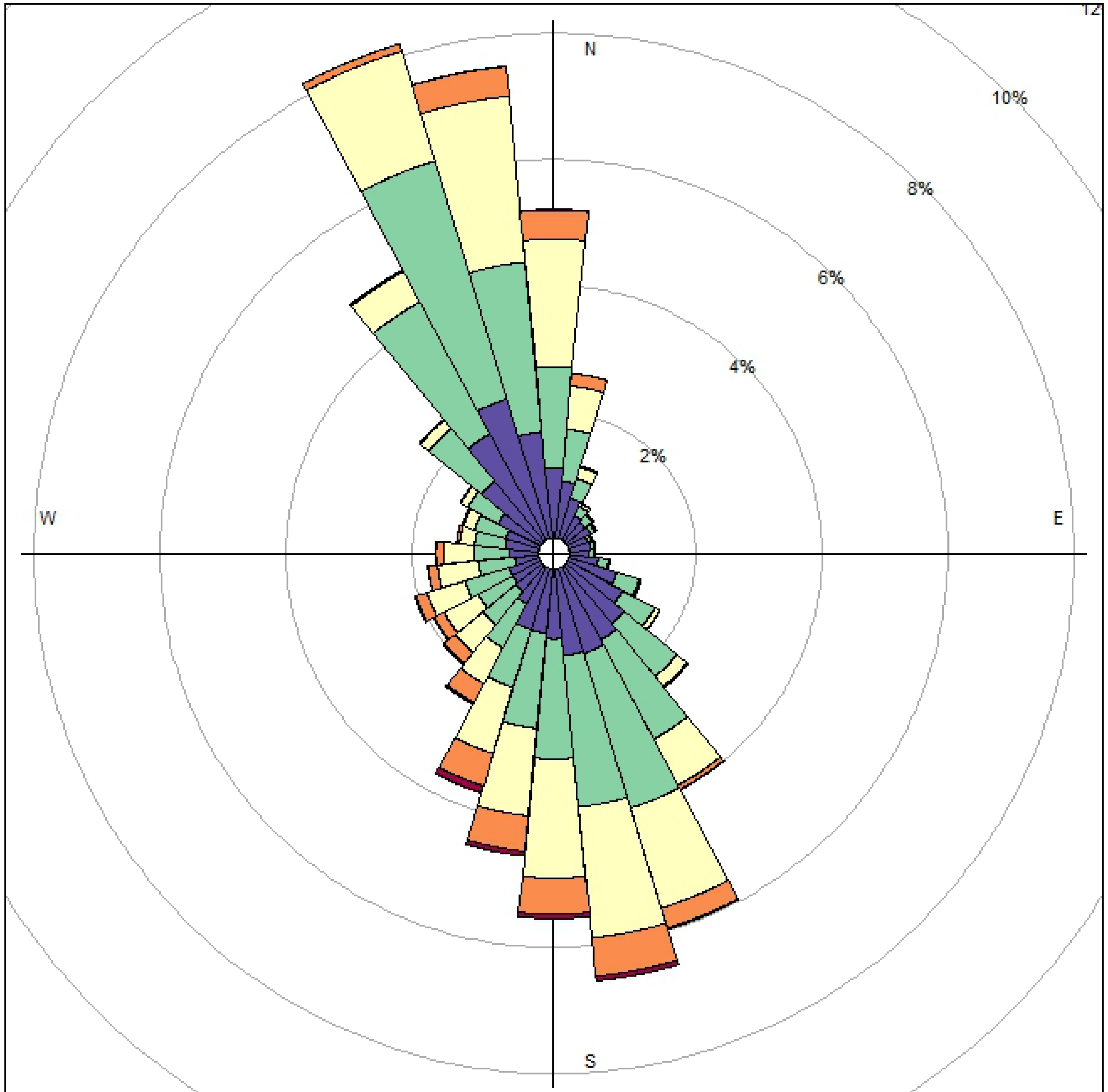

Figure 4-1
Wind Rose

Collins Pine Company
Lakeview, Oregon

Legend

Wind Speed

1.5 to 3 | 3 to 5 | 5 to 8 | 8 to 12 | 12 to 20

$m\ s^{-1}$

NOTES:
Bar length represents the percent time the wind orginates from the corresponding direction.
Colors represent wind speed.

KEY MAP

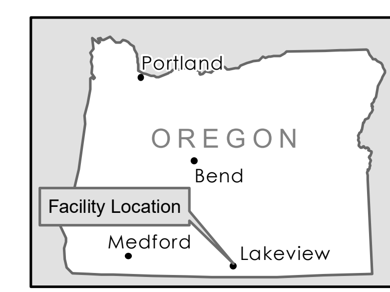

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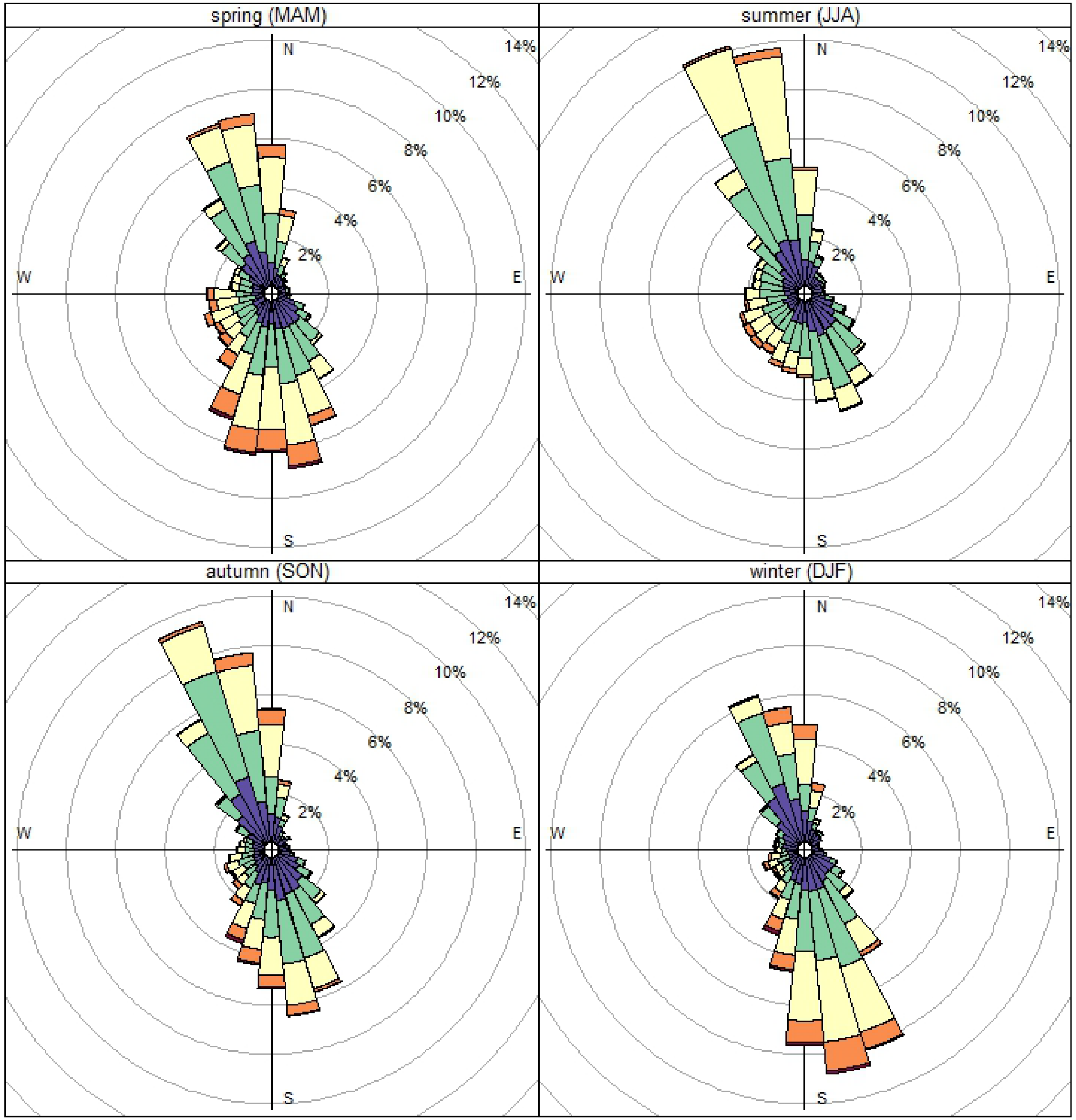
Figure 4-2
Seasonal Wind Rose

Collins Pine Company
Lakeview, Oregon



Legend

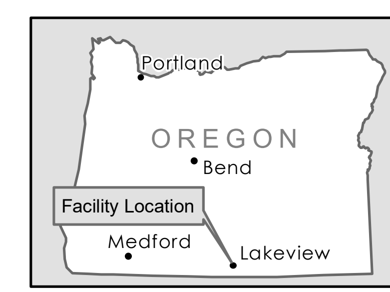
Wind Speed

1.5 to 3	3 to 5	5 to 8	8 to 12	12 to 20

m s^{-1}

NOTES:
Bar length represents the percent time the wind orginates from the corresponding direction.
Colors represent wind speed.

KEY MAP



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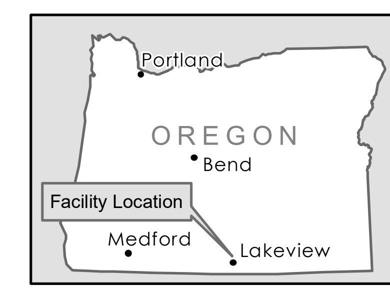
Print Date: 4/1/2020
Approved By:
Produced By: sturner
Project: 1443.03.01

Figure 4-3
Downwash Structures and Toxic Emission Unit Locations
Collins Pine Company
Lakeview, Oregon

Legend

- Point Source
- Volume Source
- Downwash Structure
- Property Boundary
- UTM Grid Guideline



0 40 80
Meters

Source: Aerial photograph obtained from Esri ArcGIS Online

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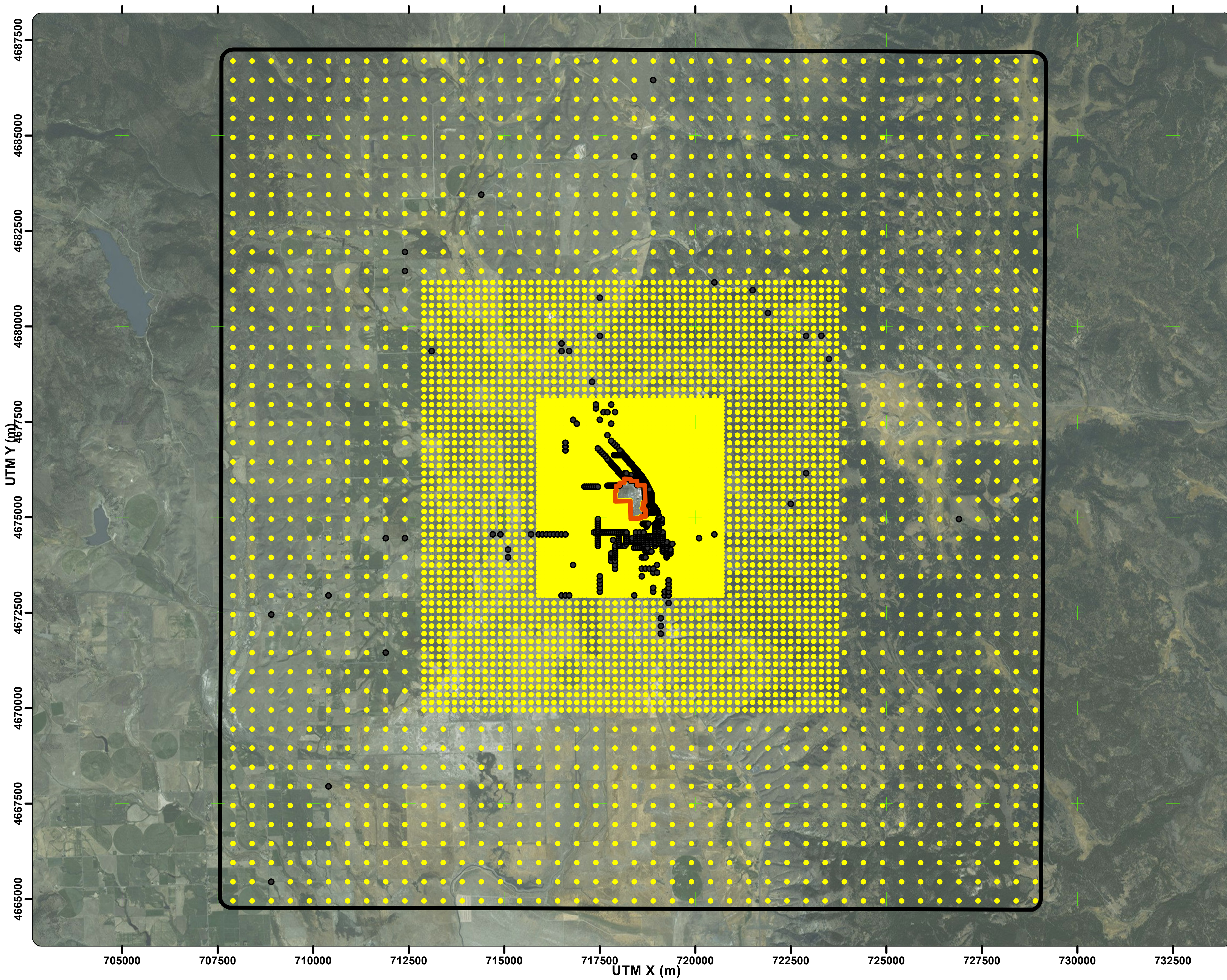
Path: X:\8006.59\01\Projects\Fig4_3_Proposed_Downwash_Emission_Source.mxd
Print Date: 4/1/2020
Approved By:
Produced By: mjosef
Project: 1443.03.01

Figure 4-4
Receptor Locations Within the Modeling Domain

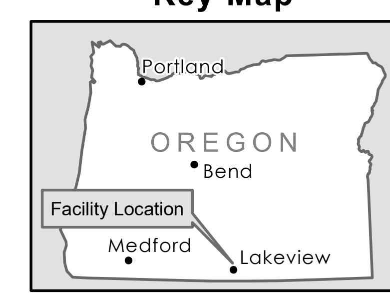
Collins Pine Company
Lakeview, Oregon



Legend

- Receptor Locations Included in Risk Analysis
- Receptor Locations Not Included in Risk Analysis
- Property Boundary
- UTM Grid Guideline

Key Map



0 1,500 3,000
Meters

Source: Aerial photograph obtained from Esri ArcGIS Online

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Path: X:\8006.59\01\Projects\Fig4_4_Proposed_Receptor_Locations.mxd
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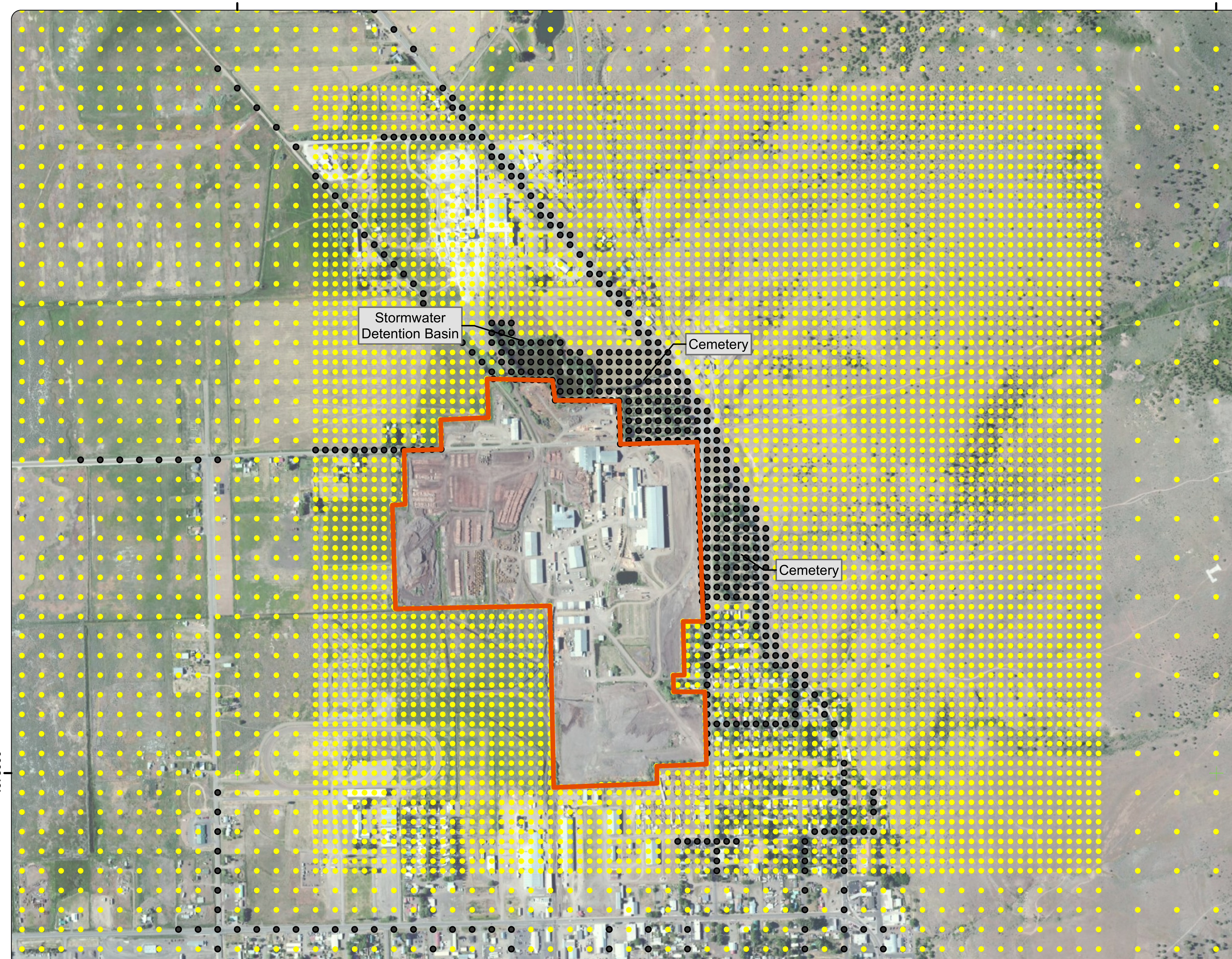
Project: 8006.59

Figure 4-5
Receptor Locations in the Immediate Area

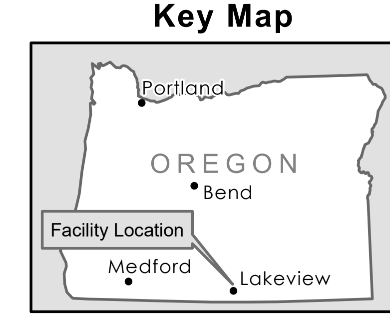
Collins Pine Company
Lakeview, Oregon



Legend

- Receptor Locations Included in Risk Analysis
- Receptor Locations Not Included in Risk Analysis
- Property Boundary
- UTM Grid Guideline

Key Map



0 160 320
Meters

Source: Aerial photograph obtained from Esri ArcGIS Online

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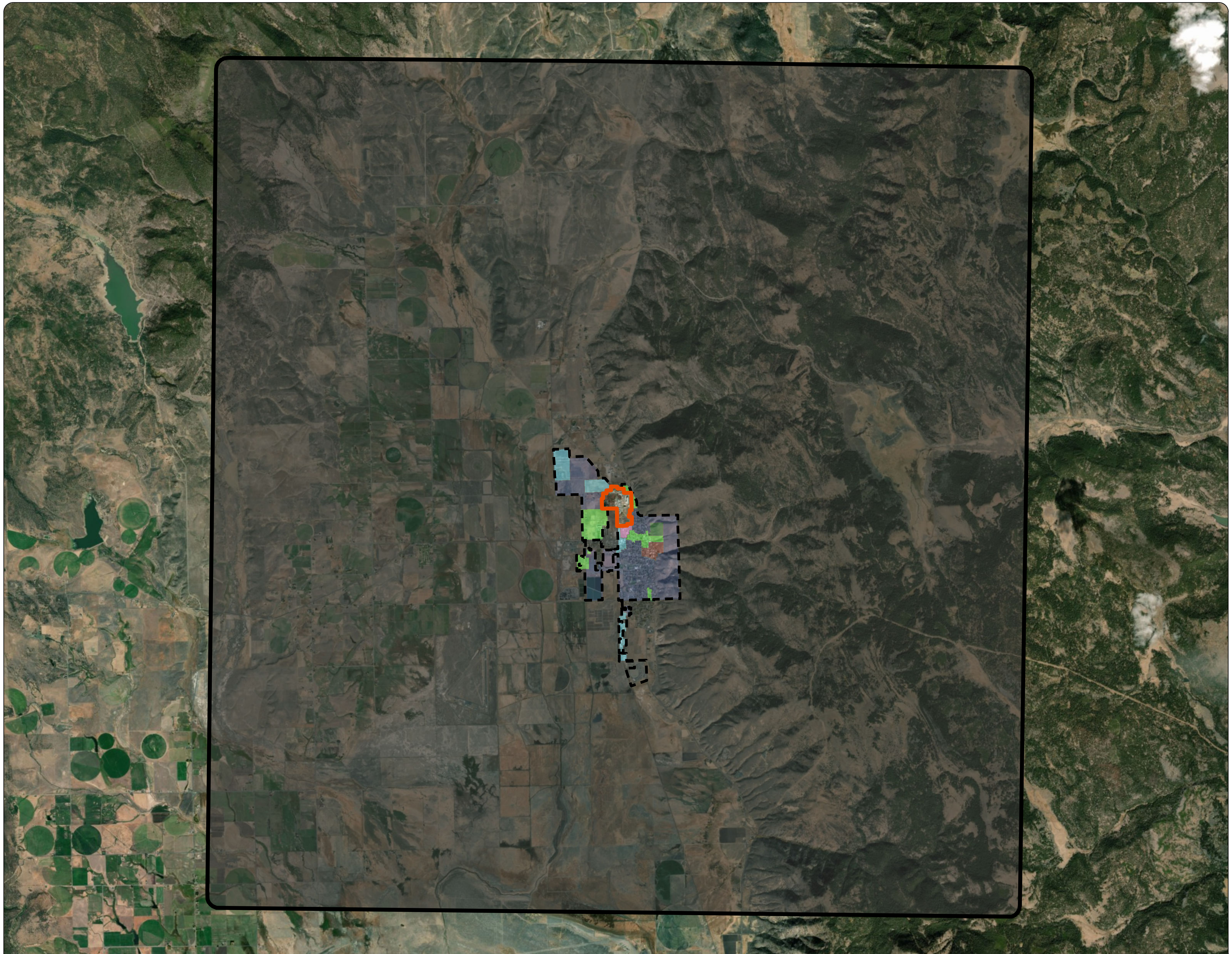
Path: X:\8006.59\HHRA_Level3_CAO\GIS\Fig4_5_Proposed_Receptor_Locations.mxd
Print Date: 3/8/2021
Reviewed by: L. Riley
Produced By: aguse
Project: 8006.59

Figure 4-6
Existing Land-Use Zoning Classifications

Collins Pine Company Lakeview, Oregon



Legend

- Property Boundary
- Proposed Modeling Domain Extents
- City Limits (2018)

Lakeview Zoning

- Central Commercial
- Central Commercial - Highway
- General Industrial
- Industrial Commercial Subdistrict
- Residential
- Residential - Multi-Family

Oregon Statewide Zoning (2017)

- No Data / Other

0 1 2
Kilometers

Source: Aerial photograph obtained from Esri ArcGIS Online. Parcel and land-use zoning data obtained from Lake County. Zoning comprised of City of Lakeview, & State of Oregon data.

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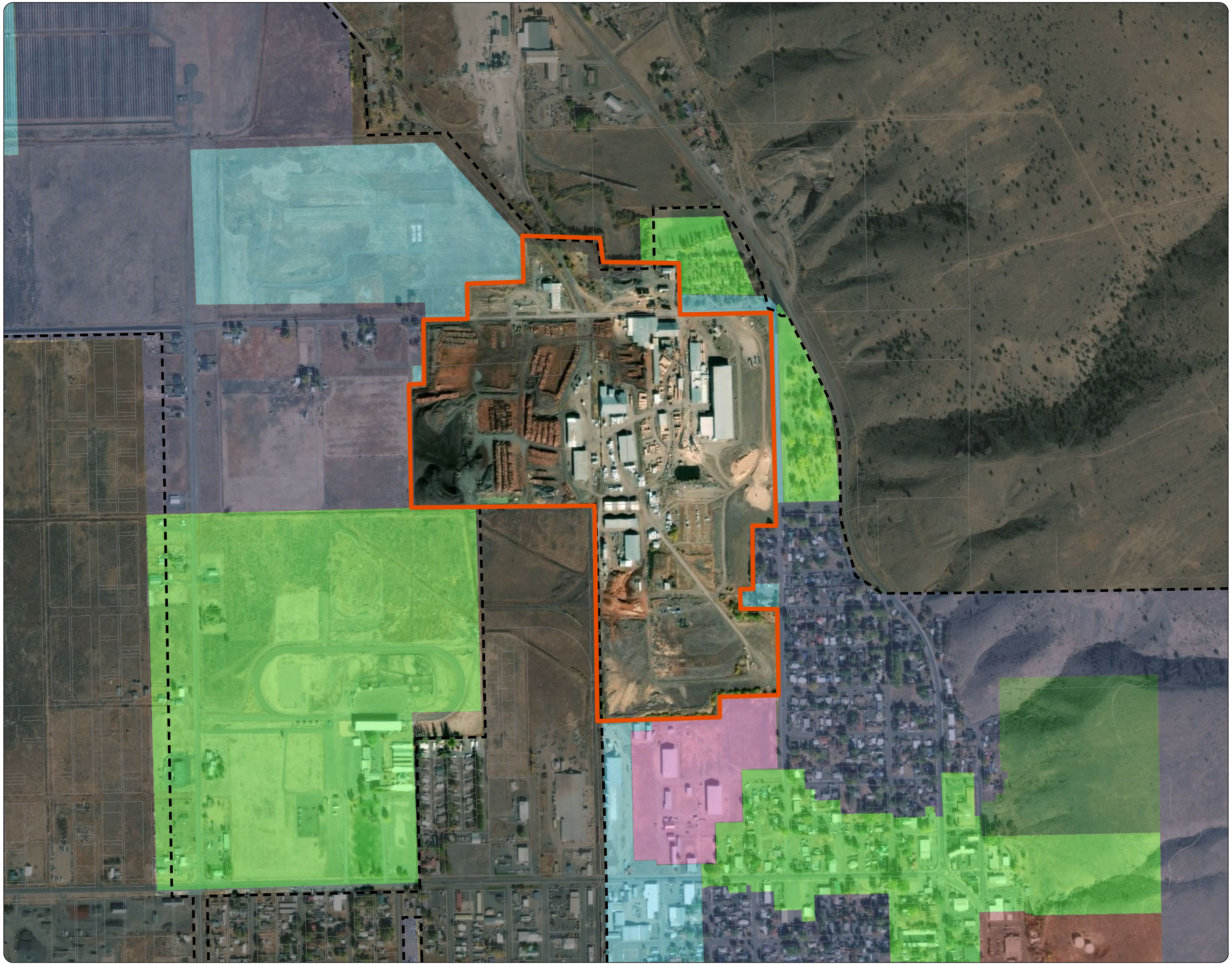
Path: X:\8006.59\HHRA_Level3_CAO\GIS\Fig4-6_Existing Land-Use Zoning Classifications.mxd
Print Date: 4/1/2020
Approved By:
Produced By: aguse
Project:

Figure 4-7
Existing Land-Use Zoning Classifications in the Immediate Area

Collins Pine Company
Lakeview, Oregon



Legend

- Property Boundary
- City Limits (2018)

Lakeview Zoning

- Central Commercial
- Central Commercial -
- General Industrial
- Industrial Commercial
- Residential
- Residential - Multi-Family

Oregon Statewide Zoning

- No Data / Other

0 100 200
Meters

Source: Aerial photograph obtained from Esri ArcGIS Online. Parcel and land-use zoning data obtained from Lake County. Zoning comprised of City of Lakeview, & State of Oregon data.

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Path: X:\8006.59\HHRA_Level3_CAO\GIS\Fig4-7_Existing Land-Use Zoning Classifications Immediate.mxd
Print Date: 3/31/2020
Approved By:
Produced By: aguse
Project:

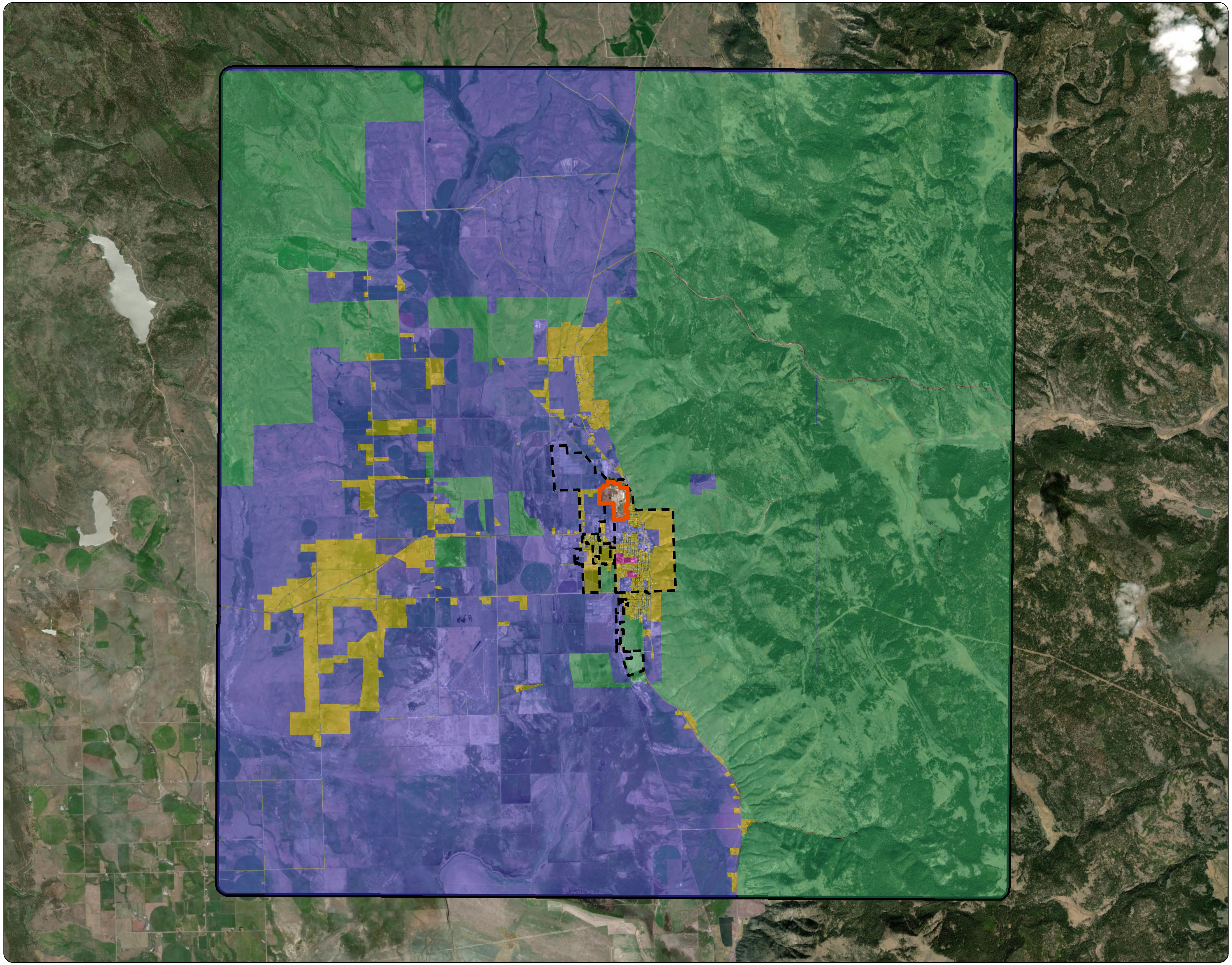

Figure 4-8
Exposure Categorization Within the Modeling Domain

Collins Pine Company
Lakeview, Oregon

Legend

- Property Boundary
- Modeling Domain Extents
- City Limits (2018)

RBC Classification

- Residential
- Child
- Worker
- Acute-Only

1. Land-use zoning data obtained from the City of Lakeview, & State of Oregon.
2. Existing land-use zoning classifications revised to reflect one of the four risk-based concentration categories presented in Oregon Administrative Rule 340-245-8040 Table 4.
3. Non-taxlot land-use zoning areas (e.g., interstate right-of-way) will not be assessed for cancer or noncancer risk.
4. RBC = risk-based concentration.

0 1 2
Kilometers

Source: Aerial photograph obtained from Esri ArcGIS Online. Parcel data obtained from Lake County.

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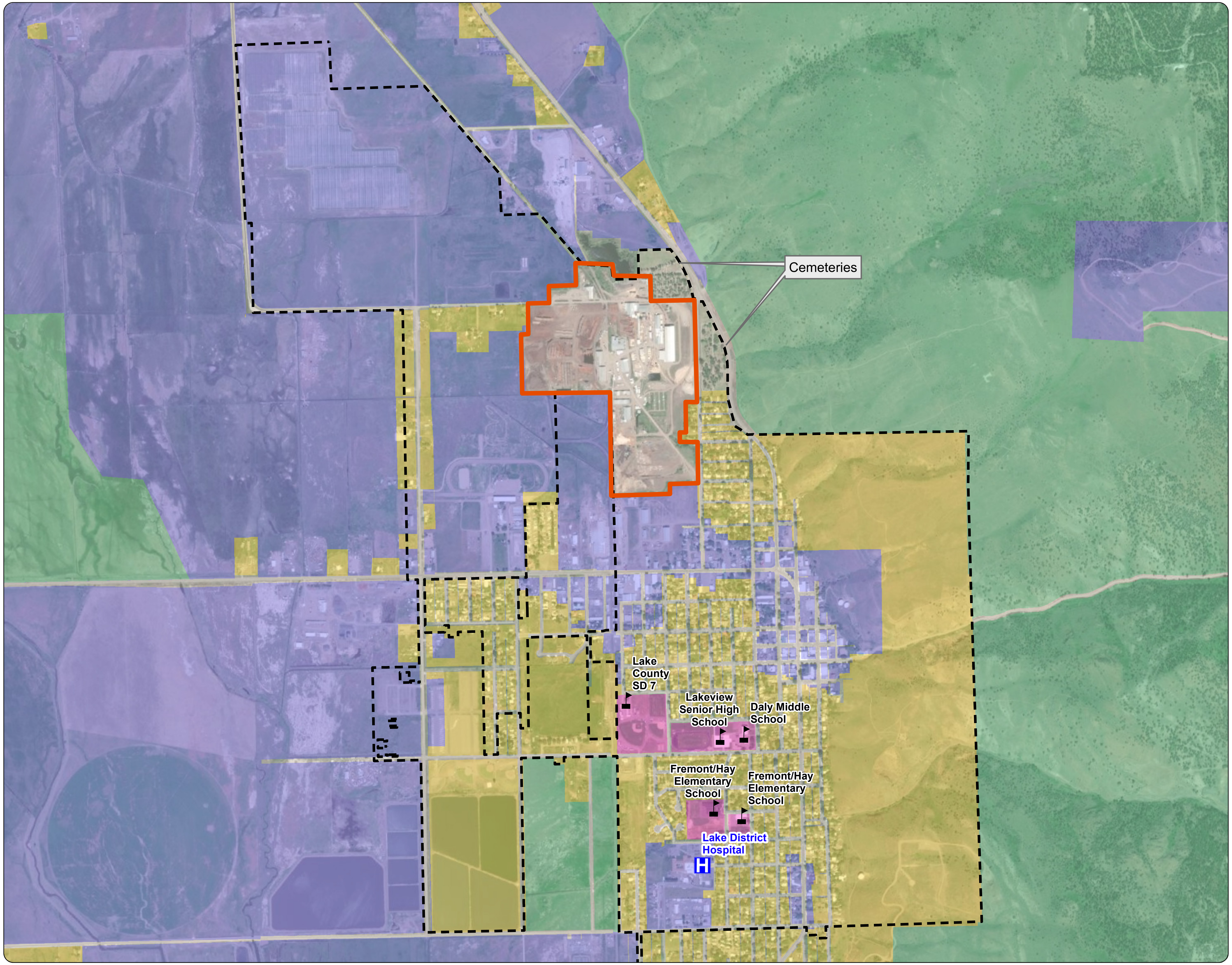
Figure 4-9
Exposure Categorization in the Immediate Area

Collins Pine Company
Lakeview, Oregon



Legend

- School Location (2015-16)
- Hospital Location (2014)
- Property Boundary
- City Limits (2018)

RBC Classification

- Residential
- Child
- Worker
- Acute Only

1. Land-use zoning data obtained from the City of Lakeview, & State of Oregon.
2. Existing land-use zoning classifications revised to reflect one of the four risk-based concentration categories presented in Oregon Administrative Rule 340-245-8040 Table 4.
3. Non-taxlot land-use zoning areas (e.g., interstate right-of-way) will not be assessed for cancer or noncancer risk.
4. RBC = risk-based concentration.

0 100 200
Meters

Source: Aerial photograph obtained from Esri ArcGIS Online. Parcel and land-use zoning data obtained from Lake County.

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